MAY 15, 1994
VOLUME SEVEN NUMBER FIFTEEN
SEVEN DOLLARS

CIO

THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY

Spanning The Globe

How One Company Used Open Systems To Close The Gaps

ALSO INSIDE

The Patent Paradox

Trafalgar House Engineering's Jim Noble

AN INTERNATIONAL DATA GROUP PUBLICATION

Putting Technology

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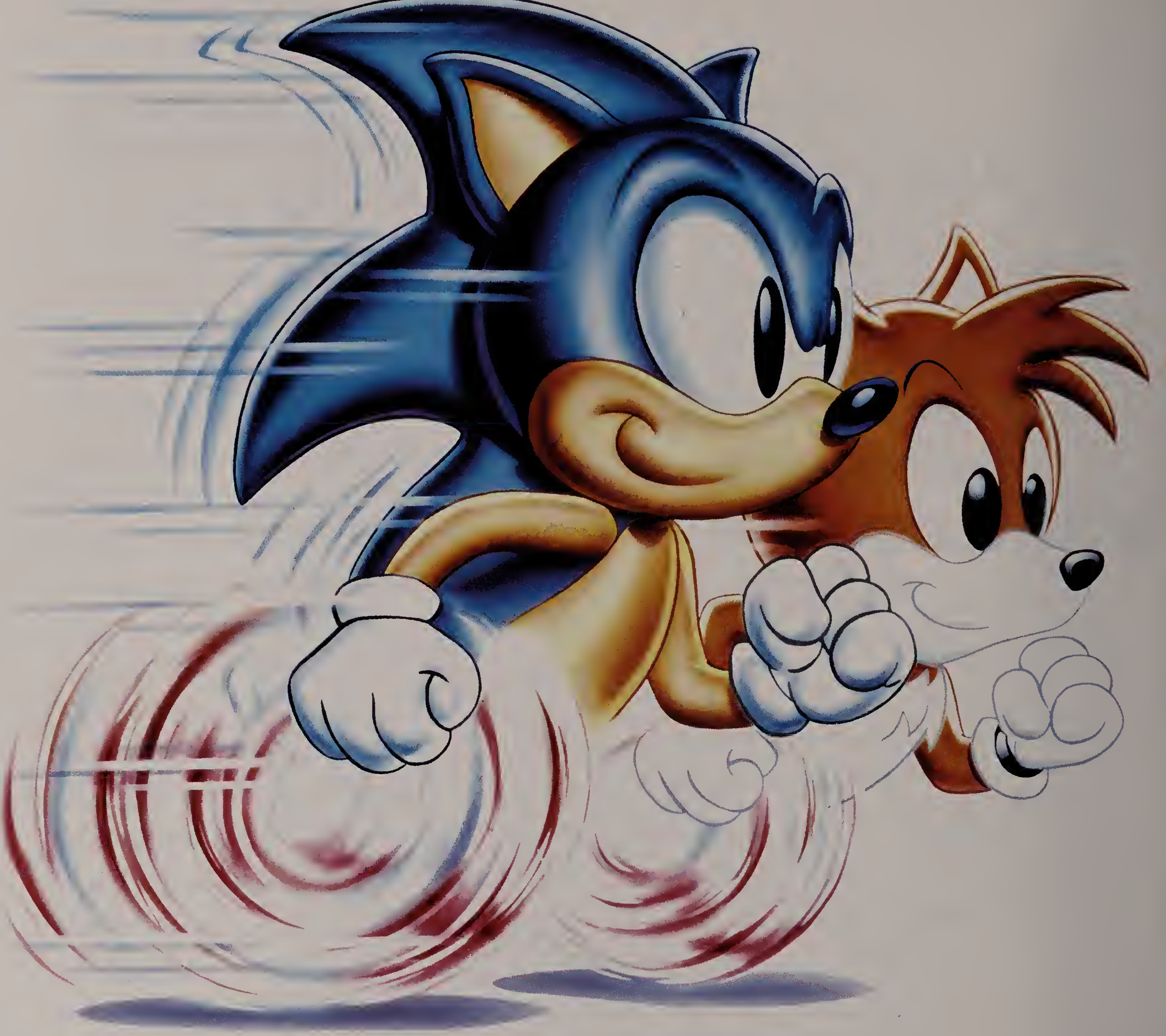

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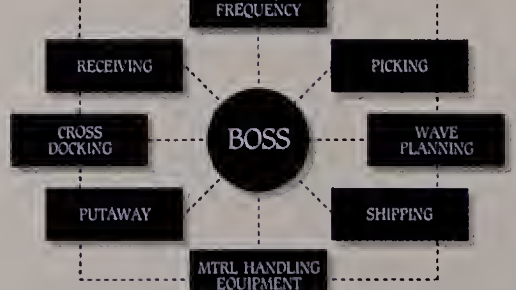

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Turning an organizational disadvantage into an asset, Trafalgar House PLC used open-systems global networking to become a virtual company.

By Nancy Hitchcock

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Cover photo by Peter Jordan/
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The trials AT&T's Bell Labs conducts in its Consumer Laboratory let the company test the waters of the telecommunications market before launching new products.

By Megan Santosus

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The Patent Trap

Critics say that flaws within the U.S. patent system leave software makers' investments at risk and quash the very progress the system was created to promote. What does this mean for you, the customer?

By Leigh Buchanan

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Redefining Moments

IS departments seeking to redefine their service strategies need to stop relying on old assumptions, look at what they're doing now and listen to what their customers expect from them in the future.

By Richard Pastore and Carol Hildebrand

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thoughts **74**

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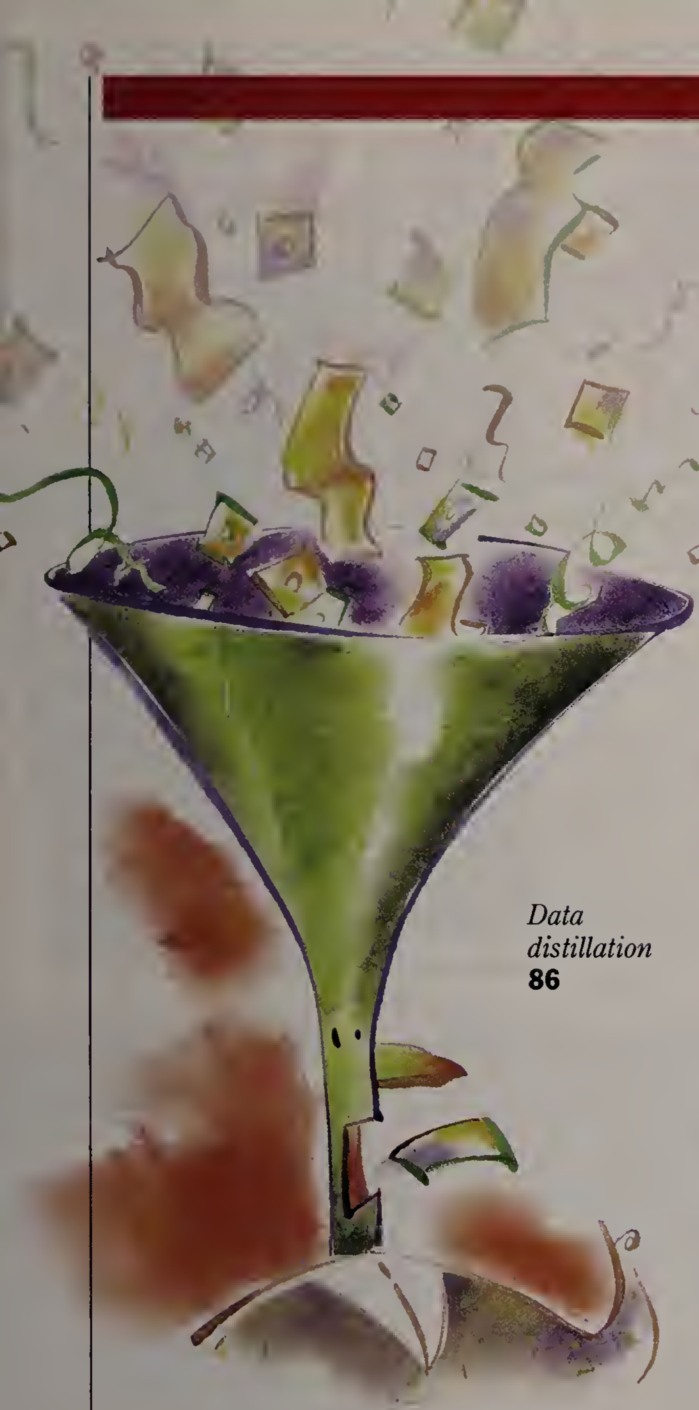

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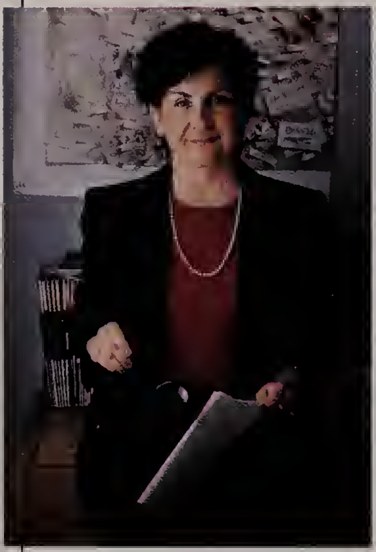

When Senior Editor Leigh Buchanan traveled to Washington earlier this year to visit the U.S. Patent and Trademark Office (PTO), she assured us there were big things afoot there for CIOs.

In her article "The Patent Trap," beginning on Page 64, Buchanan looks at how patents can and do affect companies where information systems play a strategic, operational role. The PTO is under fire for awarding patents that are too broad and that fail to adhere to the agency's criteria that an invention be truly "new" and "nonobvious."

Dubious patent awards primarily affect software vendors. But the threat of litigation inhibits the ability of those vendors to serve their customers—and may even jack up the price of their products as they pass along the cost of litigation or royalty payments.

Infringement lawsuits have also been directed against user companies. A case in point involves a former broker for a business unit of Prudential Insurance, whose company patented a computer system that performs certain functions vital to the Prudential unit's product. But the patent also covers the business processes enabled by that system. And the head of the business unit warns that similar situations could easily occur in other financial-services organizations and industries.

From the vendors' perspective, patents can have a variety of debilitating effects. Some claim that patents limit the speed with which they can create new products and divert gifted developers from inventing new products to defend existing ones, Buchanan reports. What's more, the prospect of lengthy and costly lawsuits has driven some vendors to agree to royalty payments, even when the patents they are accused of infringing may not be valid.

Our article provides a good deal of cautionary information and examines what the PTO is doing to fix the situation. It is yet another reminder of how decisions made in Washington can affect every part of the organization—including the IS department.

Marcia Blumenthal

PHOTO BY WEBB CHAPPELL

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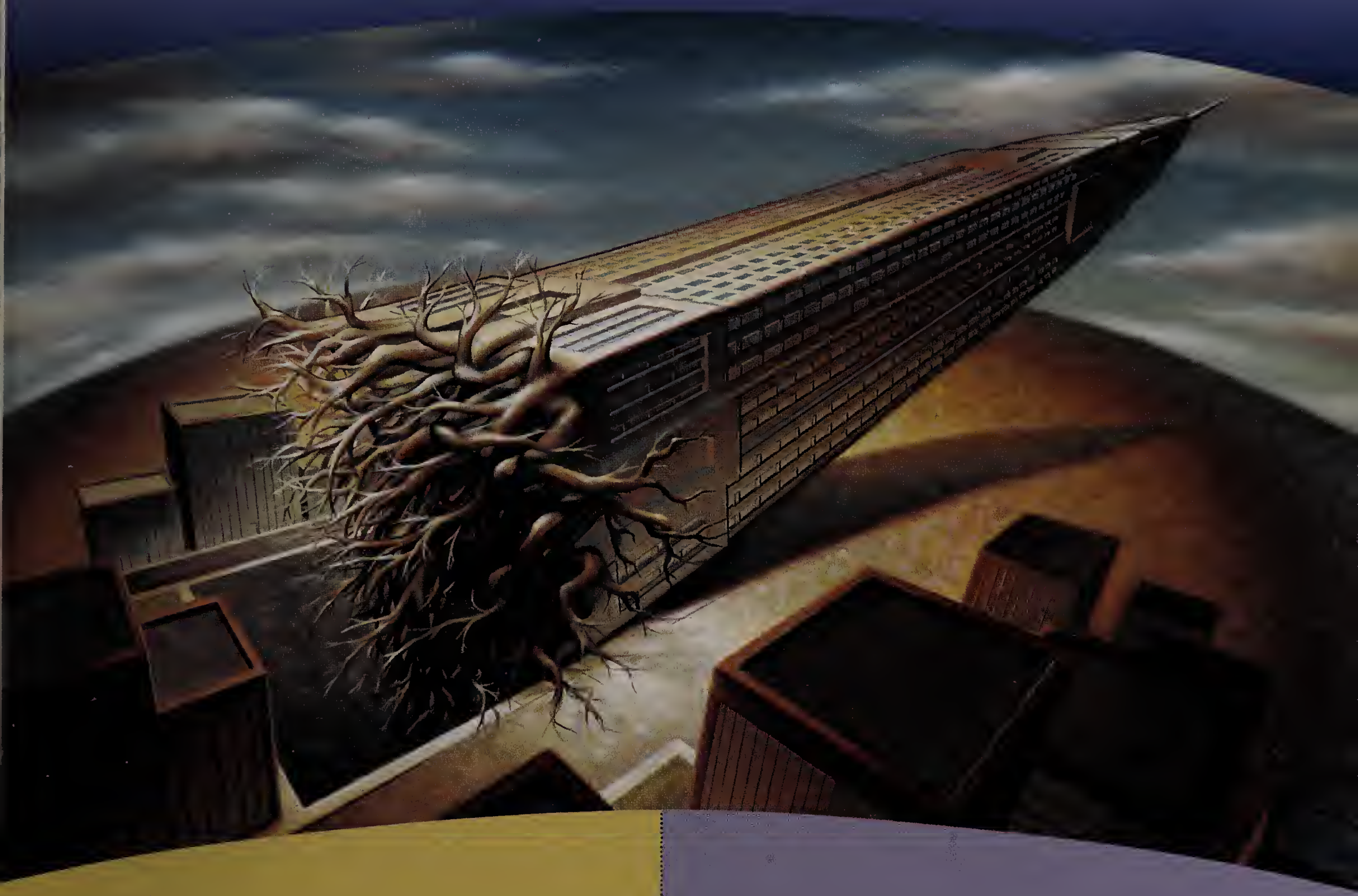

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> *"We're trying to turn…data into useful information, then knowledge and finally wisdom. That's the way we can ensure that we are offering the best products for the consumer."*
>
> *—John A. Greco Jr.*
> *Head of service concepts & business analysis*
> *AT&T Bell Laboratories*

The success AT&T Bell Laboratories has attained using advanced market-research tools and techniques to test new products and services demonstrates the value of partnership between marketing and product development (see "The AT&T Test Kitchen," beginning on Page 36). By staying focused on the ultimate goal—happy customers—AT&T's marketing and development teams are creating value for the company and its customers by ensuring that products and services meet consumer requirements long before they are offered on the mass market.

For example, AT&T's Bell Labs conducts extensive product testing at its Murray Hill, N.J., Consumer Laboratory, simulating real-world scenarios for target consumers. Extensive use of videotaping, computer-based surveys and discussions with consumers yield powerful information that shapes the end product into what the consumer wants and values.

For AT&T, the alliance between marketing and development has created positive business results that translate into bottom-line cost savings, including a 50 percent reduction in cycle times over the last three years and a 25 percent reduction in product-rework time. Most important, consumers are getting the products and services they want—and are willing to pay for.

We can all learn from AT&T's example by continually examining and refining our methods for obtaining customer input and by adopting customer-focused research and marketing strategies in our own businesses. This is certainly a process we strive to achieve at CIO Publishing. If you have comments or suggestions regarding our efforts, please let me know.

P.S. Please join world-renowned business visionary Peter Drucker and your peers at the next CIO Perspectives conference, "IT Economics: Business Value & Profit Maximization," to be held Oct. 23-26 at La Paloma in Tucson, Ariz. For more information, please call our toll-free hot line at 800 366-0246.

Coming In CIO

Special Section: Global Enterprises

Most companies today do business internationally, but few have stepped up to the challenge of real globalization. As trade barriers come down and more reliable communications come up, however, more and more organizations are taking on that challenge—with many a CIO shouldering a huge responsibility. Infrastructure—tools, applications, databases and the telecommunications network to make them accessible—is the word of the day for companies seeking to globalize what has traditionally been a collection of independent national organizations. In addition to the accounting and currency differences among countries, systems must also take varying government regulations, standards and customs into account. Information executives, meanwhile, must learn to think in a new way—and help their staffs do the same. In this special section, *CIO* takes a close look at the key issues involved in going global.

Sales Pitch

In this day of cutthroat competition and fleeting customer loyalty, a traditional approach to sales automation may not be enough. Some say the same reengineering concepts used in manufacturing must be applied to sales and marketing in order to create a sustainable competitive advantage. The idea is to harness technology to create processes that put the customer—not the sales rep—first.

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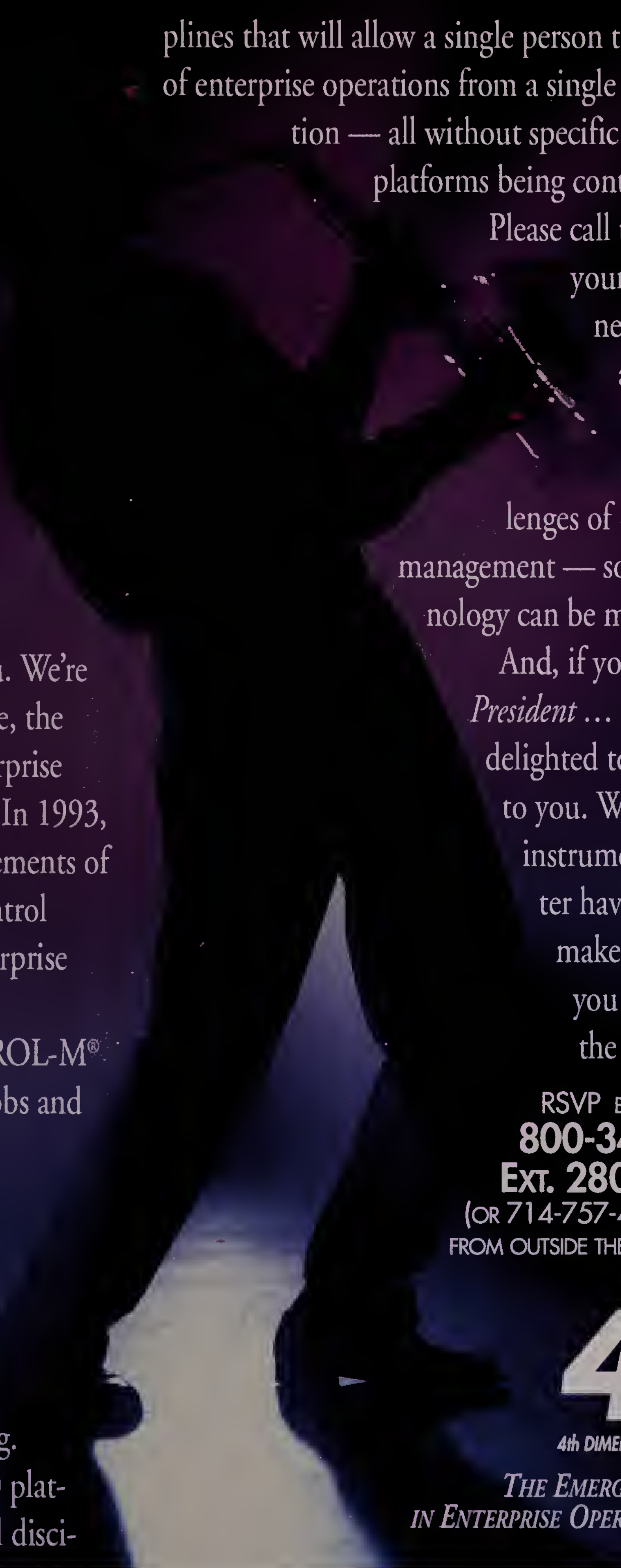

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For determined pursuers of information, a roadblock on the information superhighway is merely a detour.

Consider what happened last summer during one of the most sensational murder trials in Canada's history. The case, which involves such grisly elements as torture and snuff films, has received considerable attention in the United States and abroad, including coverage in *The Washington Post* and on the television show *A Current Affair*. When an Ontario judge prohibited publication of the details in Canada in order to ensure a fair trial for one of the defendants, the Canadian media, which is accustomed to such bans, generally respected it. Distribution of accounts from outside Canada was also forbidden.

But the judge didn't count on the unstoppability of information flow across the Internet. Discussion among Canadian "ban breakers" soon moved into cyberspace, where the sheer impossibility of enforcing such a mandate rendered it effectively meaningless. The most celebrated meeting place was a Usenet news group, called alt.fan.karla-homolka, dedicated to discussing the case's details. Once discovered by officials, however, the news group was banned at many sites across Canada.

The removal of information from the Internet has been met with outrage by many users, who consider it in direct opposition to many of the network's original goals. And it has spurred debate about censorship and the liability of Internet providers that simply offer access to information that originated elsewhere.

MURDER!
MUTILATION!
SEX!
HORROR!
HL

The University of Toronto is one site from which the news group has been pulled.

"We checked with our lawyers and [others], and they said that we could be considered as sort of a distributor—and hence potentially the publisher—of such things by making it available on recognizable, institutional University of Toronto computers,"

SMALL IS BEAUTIFUL

If you're looking for an organization with truly overwhelming storage problems, the U.S. General Services Administration is a good place to start. Among other things, the GSA is responsible for making sure the government receives telecom services. A single copy of a monthly phone bill amounted to 1.1 million pages, or hundreds of boxes of computer printouts. And because of government regulations, the agency couldn't throw any of it away.

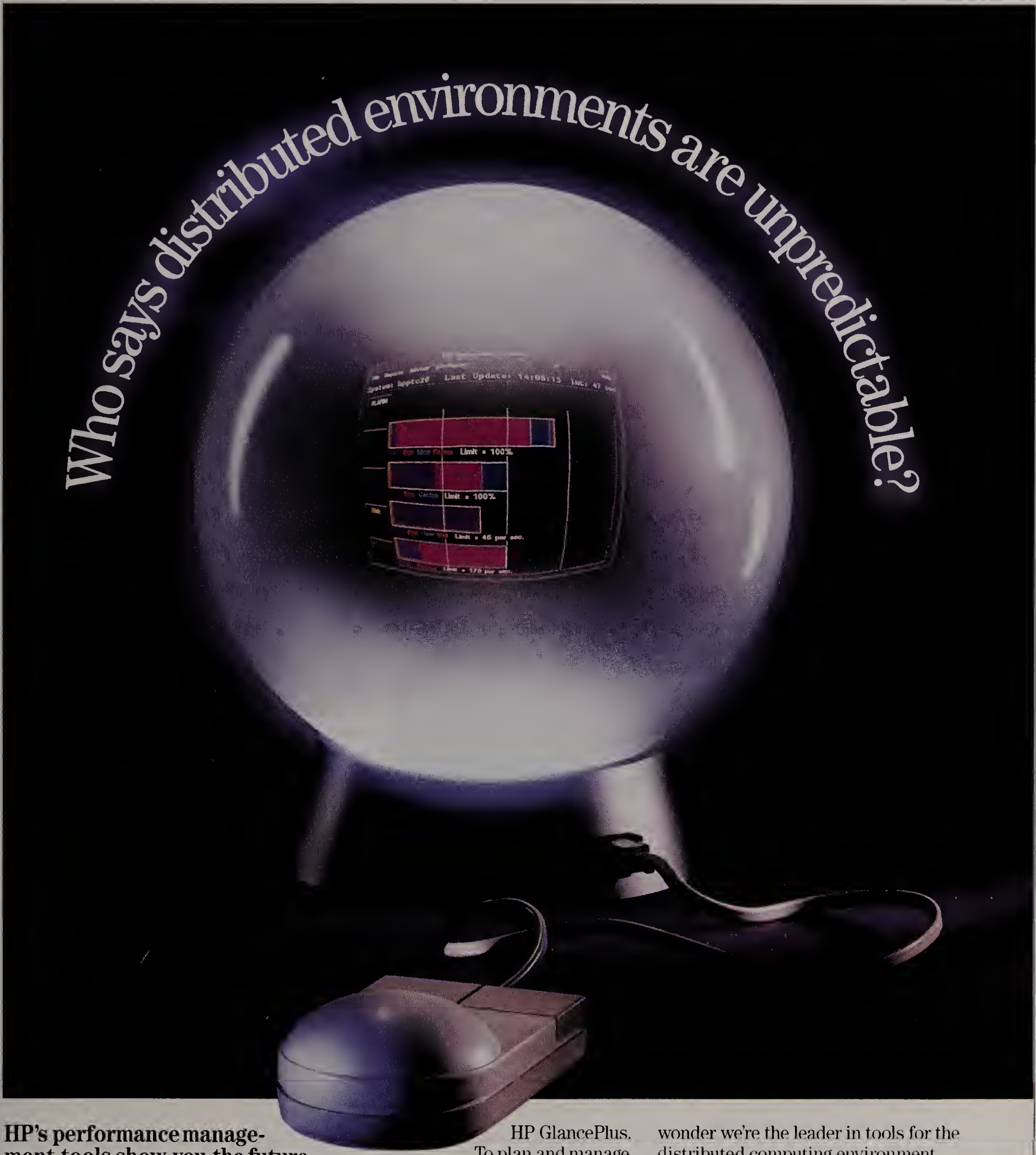
What the GSA needed was reliable, high-capacity storage and fast access to volumes of data. It chose to convert to optical media. With the project's successful completion last winter, the agency now receives the million-page behemoth on a half-dozen 5.25-inch compact discs. As a result, the GSA can store in four inches of shelf space what used to fill 400 boxes. A full year of invoices, which would have required 132 tons of paper, now occupies less than 42 inches of shelf space.

The GSA collaborated on the project with AT&T, the service provider for the Federal Telecommunications System 2000. AT&T has agreed to convert the agency's historical invoices to optical media as well.

Not only has the project reduced the need for storage space, but it has improved productivity as well, according to Ron Milam, GSA director of billing management. Invoices are processed faster and more efficiently, and GSA and AT&T personnel can respond to billing questions in seconds rather than days. The conversion has also paid off for the environment, saving 2,148 trees and 312 barrels of oil a year, the agency estimates. ■

PAPER VS. OPTICAL DISK: *Ron Milam (holding paper roll) compares the two media with a multivendor team.*

ILLUSTRATION BY HAL MAYFORTH; PHOTO COURTESY OF GSA



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TRENDLINES

says Warren Jackson, director of network and operations services in the university's computing and communications division. "We're doing this because we were told it was illegal. That is...the only reason." Jackson also serves as membership coordinator for the ONet, which is the primary provider of news groups to Internet sites in Ontario. The news group was pulled from there as well.

"The thing that we couldn't do was keep anybody from getting their hands on the stuff," Jackson adds. Indeed, rather than suppressing coverage of the case, the overall effect of the ban has been to make obtaining information from alternate channels something of a national hobby. Ban breakers are flocking electronically to sources in the United States and elsewhere and can participate in discussions anonymously at a site based in Finland.

A University of Toronto student newspaper even published directions to alternate sources, causing some debate about whether such actions could be considered aiding and abetting a crime. Says Jackson, "It's like me saying, 'I know this information is in the *Washington Post* archive. How do you get to Washington? Well, you drive south and hang a left at the signpost.' It's exactly the same kind of thing."

"This is a true test of the freedom of speech here," one user explained in a *Manchester Guardian* article. "They'd have to shut down the whole net [and tape our mouths shut] to completely stop all the information flow.... Electronic communication is either going to free us or enslave us. Make your choice now." ■

The Electronic Grapevine

An employee at Jack Daniels Tennessee Whiskey is mulling over three burning questions. How will a proposed tax on spirits affect the company's stock? Are the rumors about an executive-level opening in the marketing department true? And will there be a choice of baked or mashed potatoes with the hot turkey sandwich at lunch?

Brown-Forman Corp., parent of Jack Daniels, Lenox China and other consumer-product companies, has taken an all-the-news-that's-fit-to-put-online approach to keeping employees up-to-date. Its electronic news service is distributed to PCs and free-standing multimedia kiosks throughout the company's U.S. facilities.

The service, called B-F NewsLink, is updated daily. Employees can access corporate news from Brown-Forman's Louisville, Ky., headquarters, local news about their own offices and co-workers, and divisional news about subsidiaries (field correspondents gather information for reports from each of the company's locations). NewsLink categories include everything from employee-benefits information and job postings to what's cooking in the corporate flavor lab and the corporate cafeteria.

The system also offers a daily briefing on national and international news affecting the company's interests; the price of Brown-Forman stock is updated hourly.

The company also plans to make extensive use of the kiosks' video capability. Videos are shot in the field (all correspondents have been provided with cameras to film local activities), edited at an in-house media center at headquarters and then distributed to appropriate kiosks. A companywide video magazine is distributed to kiosks every month.

A joint effort of the IS, communications and human-resources departments, the system is currently accessed

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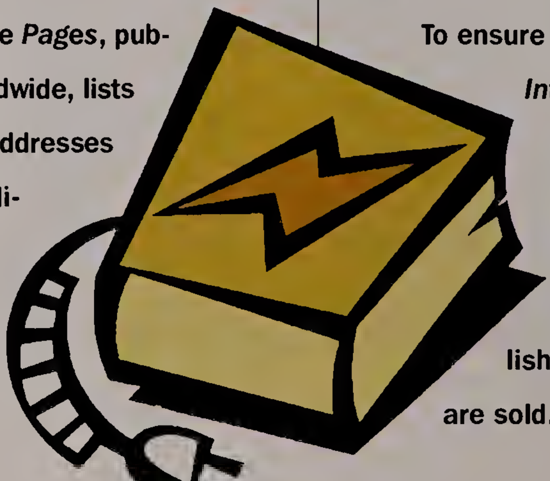
New Inklings

The phone book was an indispensable tool back in the days when you actually had to walk outside to check your mailbox or pick up a phone to chat. Now that the Internet has made such modes of communication seem practically quaint, a new guide offers a way to find the folks you want to reach out and touch electronically.

***The 1994 Internet White Pages*, published by IDG Books Worldwide, lists the names and Internet addresses of more than 100,000 individuals who frequently post messages on the Net. It also features listings for Internet service providers around the world, as well as addresses for journalists, corporate leaders and opinion makers.**

IDG Books expects the *Internet White Pages* to appeal to the 2.5 million users of commercial online services. The volume includes coupons worth $100,000 in online access to CompuServe, America Online, Prodigy and Delphi.



To ensure that its listings are current, the *Internet White Pages* will be updated quarterly (buyers are entitled to one free update). The book costs $29.95 and can be purchased from the publisher or wherever computer books are sold. Call 800 762-2974. ■

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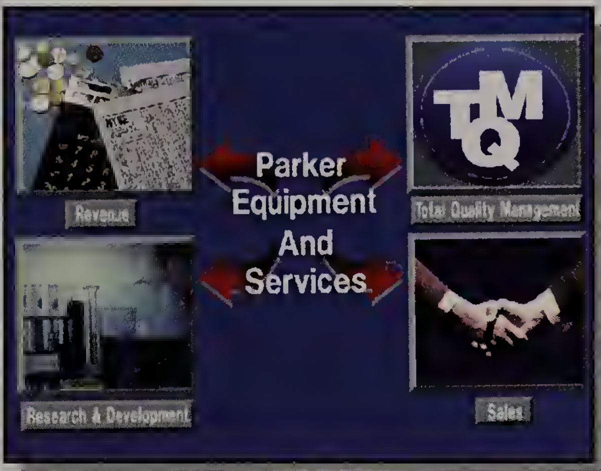

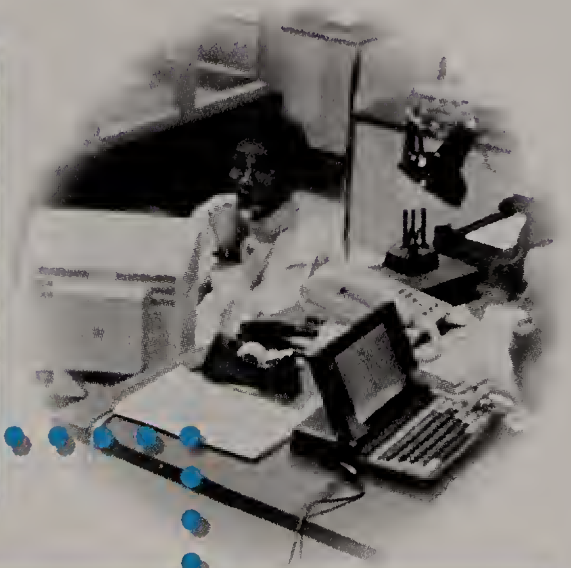

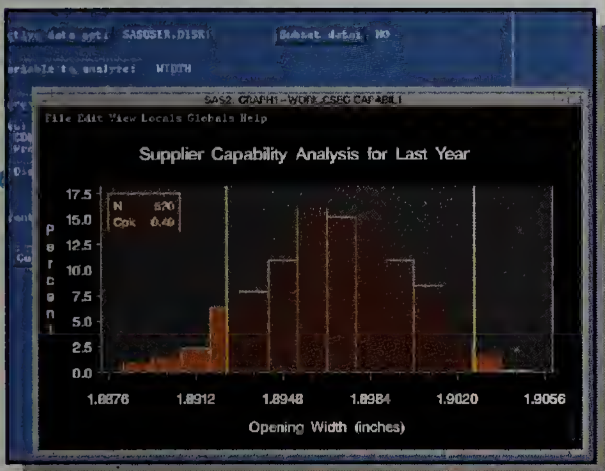

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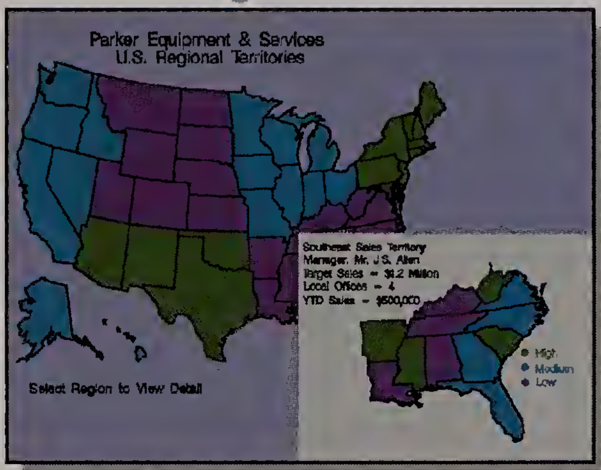

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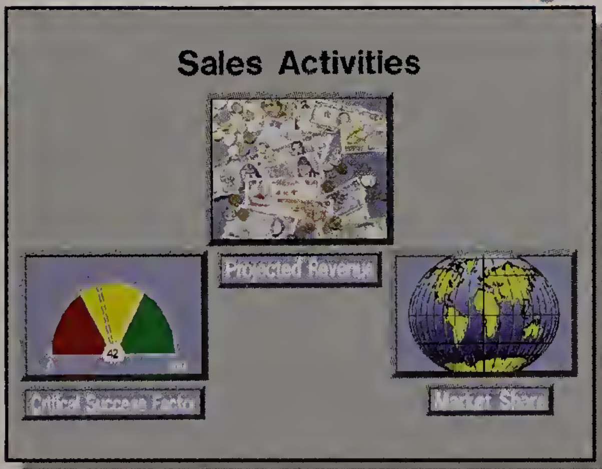

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INTERACTIVE NEWSPAPERS

All the News That's Fit To Access

Newspapers need to accelerate toward interactivity if they don't want to end up stalled in the breakdown lane on the information superhighway. That's the message editors and publishers heard at the "Interactive Newspapers '94" conference in Tampa, Fla.

Some 600 people from 25 countries attended the fifth annual gathering, a record turnout that coordinators attribute to growing recognition that newspapers can no longer view themselves as just print media. Five years ago, only 40 American newspapers offered any kind of interactive service, says John F. Kelsey III, a Pennington, N.J., media consultant specializing in interactive services. By 1993, that number had jumped to 2,700.

In recent years, some of the nation's top newspapers, including *The Washington Post, The New York Times, The Detroit News, The Orlando Sentinel* and *Newsday*, have launched projects to connect with readers in new ways, ranging from fax-on-demand to interactive TV. Right now, though, online services are grabbing industry headlines.

Ross Glatzer, Prodigy Services Co. president and CEO, says newspapers' strong local presence provides a solid base for such ventures. Using online services, newspapers can continuously update stories, get instant survey feedback, offer two-way communication with readers and provide neighborhood-by-neighborhood information.

Mercury Center, launched in 1993 by the *San Jose Mercury News* through America Online, offers much more. Subscribers can call up not only the current day's newspaper but also background stories and the full text of unpublished items, such as speeches, press releases and transcripts of news conferences. In addition, callers can scan classified ads, search the newspaper's library of past stories, participate in online "chat" sessions and post messages on two dozen electronic bulletin boards.

A stick figure dubbed "Merky" appears in print stories to refer readers to supplemental materials online. Future plans include adding other newspaper databases, display advertising and electronic "personal agents" that will find and store articles on specified topics for later reading. More than 5,300 members pay $9.95 per month for five

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COPY RIGHTS AND WRONGS

There's a new tension between expression—which is increasingly electronic—and the laws that were designed to protect it—which remain grounded in the realm of paper and print. That tension is manifest in the shifting relationship between author and publisher—especially in the contractual obligations that have traditionally bound the two.

Now, 11 freelance writers have taken up arms for the creative side, filing a federal lawsuit against some of the most prestigious publishing firms in the United States. Their complaint: The publishers placed articles they had written for newspapers and magazines online and on CD-ROM diskettes without permission—thus violating their copyrights.

The plaintiffs are seeking unspecified damages from *The New York Times*, Mead Data, *Newsday*, Time Inc. Magazine Co., University Microfilms International and the *Atlantic Monthly*. None of the authors stand to collect significant financial settlements, according to Emily Bass, attorney for the 11 plaintiffs. "In large part, this is a lawsuit that seeks a declaration of rights," she says. "We are seeking a judgment that will establish that the electronic rights belong to the author unless specifically transferred to publishers by the author."

Like many intellectual-property suits, this case arises from differing interpretations of the law rather than a disagreement about the facts. "The writers believed that they were selling first-time publication authorization rights," Bass explains. Such rights apply only to publications in print and do not extend to electronic media. But given the new opportunities for electronic publishing, Bass argues, "it's incumbent upon the publisher to negotiate the additional ability to exploit electronic rights." ■

ILLUSTRATION ABOVE BY HAL MAYFORTH; ILLUSTRATION BELOW BY MARK FISHER

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According to a recent Infonetics Research survey, the average *Fortune 1000* company loses $7.5 million a year on LAN outages alone—and even more on other systems or network outages. These companies just can't afford to operate in this fashion, so they've turned to MAXM for help.

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The results? MAXM dramatically reduces the downtime that undermines mission-critical operations, and it increases operator productivity at the same time. It vastly increases system and network resource availability, ensuring that users are satisfied and productive...today, and as the enterprise evolves. ■

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MAXM is the world's leading client/server based application for Automated Enterprise Management (AEM)—the necessary integration of well established and emerging management disciplines. MAXM gives you a consolidated, integrated view of all the elements and management systems in your enterprise—on one powerful, centralized workstation, which can then be distributed as directed. It can automatically perform scheduled tasks—and automatically respond to network and systems events—that affect the overall efficiency of your enterprise systems.

As your company moves toward today's powerful new client/server architectures while managing existing complex, multi-vendor systems and network configurations, you're facing challenges that were unheard of just a few years ago. As the most powerful AEM technology on the market today, MAXM will help you meet those challenges, so that you can enjoy the benefits of distributed computing within your entire enterprise—and provide better service to end users, more efficient use of resources, greater value for customers, and bigger profits for your business. ■

MAXM INTEGRATES ALL THE TECHNOLOGIES IN YOUR ENTERPRISE.

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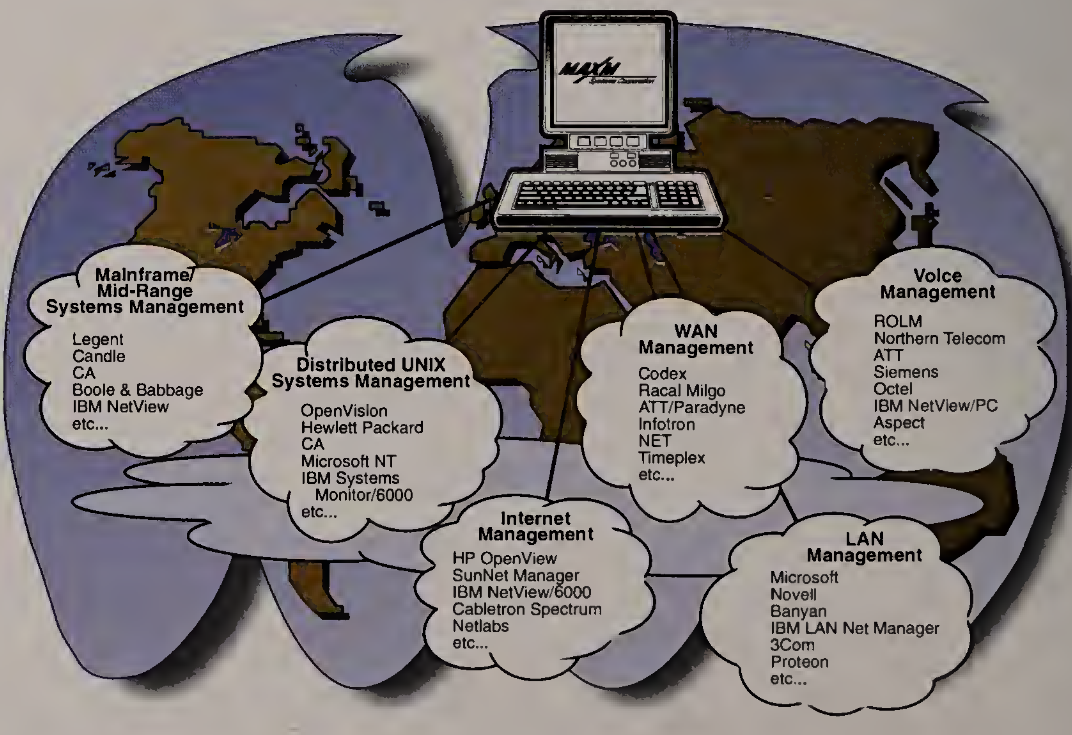

they affect your users. All the alarms and error messages, from virtually any component in your operation, are integrated into one consolidated view. And because MAXM can share management data with IBM's NetView and Sterling's NetMaster management systems, you get an integrated view of SNA and non-SNA environments alike.

Within one Wall Street-based financial enterprise, MAXM has integrated the alarm streams of dozens of dissimilar platforms. Reports this customer's VP of Operations: "Our technicians no longer run from screen to screen to scan and interpret different management consoles — and no longer miss important alarms and errors."

What does this mean for you? Consider the savings detailed by one customer in justifying the purchase of MAXM: $1,275,000 in no-longer-required staffing increases, $550,000 in a reduced need to develop and enhance existing management tools, $52,000 in reduced training expenses—all in the first year of operation. Indeed, our customers report that MAXM pays for itself in as little as a few months' time. ■

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The results? A proactive, rather than reactive, process for keeping your systems up and running. A way to identify "chronics"—network events that persistently undercut operations—and to resolve them before your internal users, or external customers, even know they exist. The removal of operator error—which, according to a study by KPMG Peat Marwick, causes 50% of all network outages—from the enterprise management equation. Freedom for your valuable IT managers to perform more strategic tasks. And, in a business climate where a few minutes' downtime can cost thousands of dollars—as it does in many transaction processing environments—enormous savings for your organization. ■

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Since implementing MAXM, this corporation has increased the scope and number of its global financial services while decreasing the number of its worldwide technical support centers. It now has a single point of control for viewing its diverse technical operations—including SNA links, LANs, the company's private network, and the networks of outsource vendors. Not only have the eleven operations centers been consolidated into a single staffed facility in Delaware and a "lights out" facility in New York, but the enterprise network now supports three times as many applications as before. A consolidated user help desk, which now responds to 95% of all calls for assistance without escalation, is staffed around the clock. With MAXM, operators can automatically check important systems at, say, 2:00 a.m. daily. Problems with applications and other key systems can be resolved automatically, and MAXM alerts an operator whenever intervention is needed—so that problems can be resolved before the workday's mission-critical operations get underway. MAXM's AEM capabilities have helped this customer reduce the volume of incoming system alert messages by more than 80%. AEM collects, filters, and prioritizes messages and alarms from dozens of different management facilities.

MAXM is at work today for many of the most demanding, mission-critical enterprises. And MAXM is dedicated to providing you with the most efficient, cost-effective Automated Enterprise Management solutions available in the industry...*today.* ■

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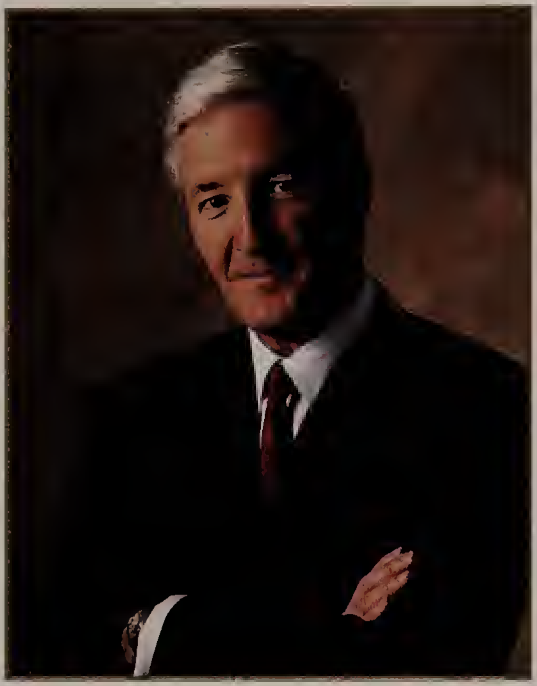

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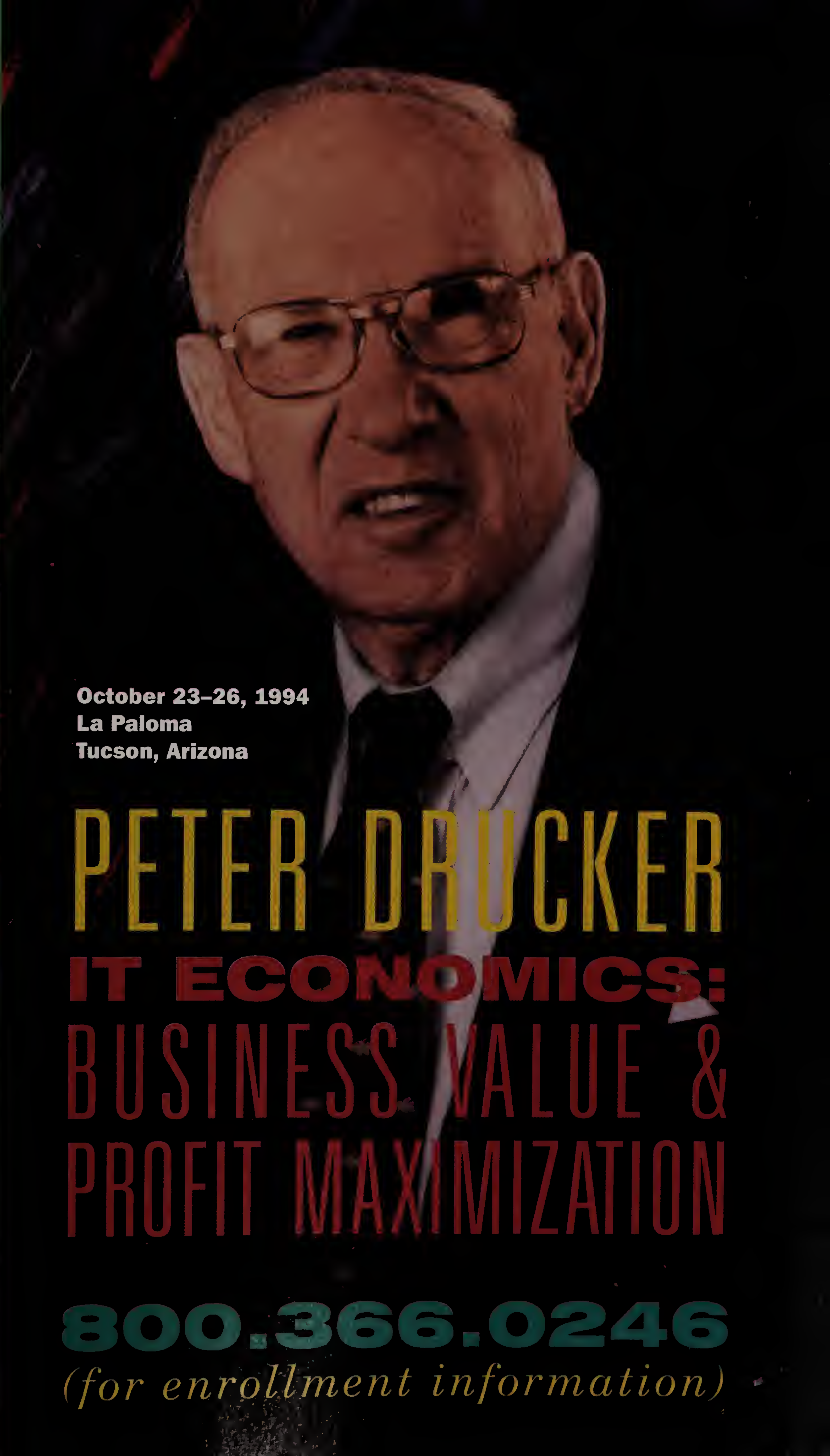

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Subscribers to Chicago Online, a similar venture started last year by America Online and *The Chicago Tribune*, can read electronic versions of two Chicago business journals and, through a deal with TicketMaster, buy event tickets online.

Such ventures make some print journalists nervous about the future of the industry—and their jobs. But Mercury Center General Manager Chris Jennewein emphasizes that online services are an extension of, not a replacement for, the newspapers themselves. Others say publications will continue to be judged on content, and that editors and writers will still have a role in sifting and analyzing information. Only the delivery "vehicles" are being transformed.

Jim Willse, a former *New York Daily News* editor and publisher who is now directing new media efforts for Newhouse Newspapers, says one thing shouldn't change: the industry's mission "to shine light in dark places."

A PRINTER TO BANK ON

Banks and post offices share more than long lines and unreasonable hours: They also often end up processing paper by hand when their electronic readers can't decipher what's written on it.

For post offices, the problem is usually penmanship; at banks, it's magnetic ink, which is encoded on checks so that they can be read electronically. Unfortunately, the quality of the ink is often so poor that banks spend more than $200 million a year manually reprocessing checks rejected by their readers.

Xerox Corp. claims that its new magnetic-ink character recognition (MICR) laser printer, the 4197-II, will eliminate much of the problem by printing checks that can be read by banks nearly 100 percent of the time. Instead of simply adding special toner to an ordinary laser printer, this model was designed specifically to create magnetic-ink documents.

The product prints everything needed on a check in a single pass—including company logo, signature and account number—using desktop computers and blank, cut-sheet paper. That means companies can eliminate preprinted check stock and the potential for fraud associated with it. Xerox says that the ability to produce checks when they are needed virtually guarantees on-time delivery of payments, simultaneously improving customer satisfaction and company control over cash funds. For information, call 310 333-7000.

OFF THE SHELF

COMPETITIVE INFORMATION SYSTEM DEVELOPMENT

By Bonnie Hohhof
The Futures Group (Glastonbury, Conn.), 1993
$270

What you don't know can hurt you. In business, it can even destroy you. And a great deal of what companies need to know in order to survive and flourish happens outside their own walls—in the halls of Congress, in the boardrooms of their competitors, and in the minds and wallets of their customers.

Intelligence information—data collected from outside the organization—is critical to operational and strategic decision making, says Bonnie Hohhof, founder and executive editor of *Competitive Intelligence Review*. In her new monograph, *Competitive Information System Development,* Hohhof offers corporations a thorough education in the creation of competitive information systems (CISs). Her emphasis is on gathering actionable information on customers, markets and competitors and analyzing and deploying that information to maximize competitive advantage and minimize nasty surprises.

Of course, no sane management team deliberately ignores outside information, but many fail to fully exploit it. Sometimes it arrives too late to be factored into a decision or is presented so poorly that trends, ratios and other relationships are obscured. Often it lacks commentary or analysts' explanation, and "without the analysis, information is merely information," Hohhof writes. Furthermore, companies without a system for defining and filling their external-information needs may find themselves drowning in a sea of publications, databases, news services, government filings—even rumor and innuendo. "Automation is an obvious solution," according to Hohhof, "but quite often a costly investment in technology ends up as an expensive file cabinet for electronic junk mail."

A better approach is to create "an organizational means by which information about a company's external environment is systematically collected, processed, analyzed and distributed to managers responsible for taking whatever action is necessary." And while such a project need not originate within the IT department, its participation is crucial, says Hohhof, who calls for both CIO sponsorship and early and active involvement of IS personnel.

Competitive Information System Development takes CIS project teams through the process of analyzing what information they have, what information they need and in what form that information would be most useful. For information or to order, call The Futures Group at 203 657-9701.

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Identity Crisis

CIOs must redefine themselves as decision makers and implementers or risk a further devaluation of their capabilities in the eyes of their business peers and the general public

BY THOMAS J. BUCKHOLTZ

CIOs have an identity problem. Ask people what a CEO or CFO contributes to an organization and you will receive quick and reasonably accurate responses. Ask what a CIO does, or even what the acronym stands for, however, and the responses will be all across the board. Worse, few of those responses will reflect the activities for which CIOs must be known if the position is to survive, let alone contribute maximally to and earn prestige within the corporation.

Many people recognize that the CIO role relates to technology: selecting the best, helping clients use it, keeping it running and containing its costs. Fine, but we would rather be associated with a broader vision of value added to the organization. We want to be known for contributions to business *results*, including financial performance, sales, customer satisfaction, cost containment, and product and service innovation. And we want to be associated with contributions to the activities of *people*—helping employees communicate with one another, find and understand information, form teams, make and implement decisions, and excel at self-empowered endeavors.

How many people readily associate us with *results* and *people*? Very few, I suspect, and the fault is largely our own. We have failed to tell our own story well, and the result is the assumption by much of the business community that CIO stands for "career is over."

The confusion over the CIO role extends to the entire information systems function. Consider these symptoms:

- Our constituents are not even certain of what our field is called. Is it information technology (IT), information systems (IS), information engineering, information architecture, information resources management (IRM) or something else? A common theme is information, but the effect is disinformation. A result: People do not know who we are and are therefore less likely to recognize ways in which we can serve them—and, ultimately, the organization.
- Undergraduate enrollment in computer science and related courses has decreased. Students may see the curriculum as suiting only those who want to design technology, perform research or teach. Many interested in the field may believe they can pick up what they need to know by taking a few classes or doing a project or two; others think they can learn it all through on-the-job experience. Still others do not know enough about the CIO position to be intrigued by it or have little idea how to pursue such a career after graduation. A result: Talented people who might have become the IS managers of tomorrow are lost to the profession.
- Our community has not succeeded in propagating an alternative to the myth that technology is all that matters. Vendors' advertising perpetu-

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ates the idea that a better, cheaper piece of hardware is the solution to almost any problem. The media also focuses almost exclusively on technology rather than on the people whose job it is to make that technology enhance the organization. A result: The public has little sense that CIOs can provide value outside their presumed expertise in technology.

These problems, which threaten the health and status of our profession, can be surmounted. But first, CIOs must act not only as practitioners in but also as ambassadors for our field. We must talk in concrete terms about what the CIO and the IS function actually can do, emphasizing the benefits we help bring about: bottom-line results and proficient, effective workforces. Technology talk should be confined to appropriate settings lest we perpetuate the usual stereotypes.

To establish a new identity, we must first define it, and the definition must be tied to *results* and *people*. A good place to start is with the government's emphasis, dating to the early 1990s, on the overall making and implementing of decisions. Viewing IS in this context—the effective use of information to accomplish goals—raises us to parity with other parts of the organization. The finance department promotes the effective use of financial techniques to accomplish business goals. The legal department contributes to business goals by using the law to protect and advance the interests of the corporation. And we in IS promote the effective use of information to help individuals and organizations achieve a wide range of goals. Our contribution is to the making and implementing of decisions.

What name best illustrates the results we foster and the service we provide? The word "proficiency" denotes the use of skills to accomplish goals. Terms like "financial proficiency" and "legal proficiency" suggest capabilities that individuals and organizations strive to achieve. So, why not "information proficiency"? That term should go a long way toward correcting the misconceptions cited above. It has the advantage of emphasizing people and results: "Proficiency" is a human attribute, unlike "systems," "technology" or "resources." Indeed, the concept could have been used at a time before the invention of the telegraph, typewriter, telephone or computer. Yet it does not detract from efforts to exploit technology or manage information as a resource.

Both businesspeople and the general public should find this concept easy to understand. Executives will appreciate this vision—they strive to build the proficiency of the organization, and, after all, this is the information age. And schools can use it as a basis for rethinking and promoting technology education.

We must expand our views of information and decision making to include the perspectives of librarians and human behaviorists, as well as of our clients.

If our field is information proficiency (IP), then we, as IP catalysts, must match words with deeds. We must add more value to strategic decision making and implementation—first by providing useful suggestions and acting as facilitators, and then by participating fully on the teams that make and implement the most important decisions.

To do so, we must expand our views of information and decision making to include the perspectives of librarians and human behaviorists, as well as of our clients. And we must look for opportunities to contribute to such decisions as whether to forge a corporate alliance or make an acquisition. Much of the value in such moves, after all, is created by the proficiency of the two groups working together. Before the decision is made, we can evaluate the potential synergy of the players; if the alliance is formed, we must help maximize that synergy.

CIOs must also work to foster awareness of this new, vital image, both inside and outside the IP community. Practitioners who consider themselves in this new light will be able to enhance the services they provide and explain to their constituents our community's contributions and potential. Clients who understand the nature of our business will benefit from having a clearer context in which to deal with us, and they will become more aware of the useful services we can deliver.

We can encourage vendors to expand their marketplace by talking about bottom-line benefits rather than simply promoting technology. It is the former, after all, that encourages technology investment.

We can work with academics to update curricula so as to promote this new focus and image. We can even teach classes ourselves. We can give public lectures, publish articles and talk with the media about what we have achieved.

Informal initiatives can make a difference. For example, starting in 1990, the federal IRM community catalyzed a governmentwide movement to improve service to citizens. This effort did not begin with legislation or budget initiatives; rather, it was the product of the vision, leadership and hard work of IRM practitioners and their clients. Even in one of the world's biggest bureaucracies, a relatively few people brought about significant change.

IP practitioners have the power to improve the way our profession operates and how it is perceived. Individuals and organizations will all benefit from developing their information proficiency. And, as a result, our field will secure both its identity and its future. CIO

Thomas J. Buckholtz served as commissioner of the General Services Administration's Information Resources Management Service. He lives in Portola Valley, Calif., near San Francisco.

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No Single Solution

Despite its success with Unix, Western Publishing doesn't look to the operating system as a cure for all its ills

BY DAVID BRANTINGHAM

Our flagship product here at Western Publishing Co. Inc. is our line of Little Golden Books, a popular series of children's stories that we've been printing for 50 years. One of the classics in the series, *The Three Billygoats Gruff*, contains a very simple, age-old moral: Don't put all your eggs in one basket. This small piece of wisdom frequently springs to mind when I consider the marketing hype we CIOs must wade through to make smart IS decisions. The sensible, cautionary lesson taught in *The Three Billygoats Gruff* rings particularly true each time I stop to analyze the valuable role Unix plays in information processing today.

If we IS professionals believed everything we read in the computer press, we'd probably conclude that any (and every) single operating system out there has the ability to solve all our IT problems. Certainly, the current focus on an OS "battle"—between the likes of Unix and Windows NT, for example—makes for good press. Some attention-grabbing questions are being posed in the headlines, such as "Who's going to win the OS war?" or "Operating systems: Which one has the momentum to dominate?"

Unfortunately, all this talk misses the point completely. Any successful IS executive will tell you that what really counts is the *network as a whole*. They'll tell you that in today's complex networks, no single operating system can do it all for an entire enterprise. There simply *must* be room for multiple environments.

This simple truth has gotten lost amid the hype. Why? Because as any computer journalist will tell you, news is conflict. It's far more rewarding—and simplistic—to write stories about the strategic battles unfolding in a so-called OS "war." By comparison, the reality of our heterogeneous, multiplatform environments is complex and dull. The real challenges we face in linking various environments together cohesively is not a hot topic—especially when compared with the lively trench warfare that occurs in an all-out marketing war.

Consider, for example, the Unix operating system. Without question, Unix is one of the most robust, mature and reliable environments available. There's no debating that point. Unix delivers on almost every front: networking capabilities, flexibility, volume of applications. And the list of Unix benefits goes on.

But, contrary to what you might hear, Unix is *not* a cure for all our IT ills. Our experience here at Western Publishing illustrates the point perfectly.

Despite all the advantages Unix provides, we are *not* totally sold on Unix as an across-the-board solution. We have no plans to go all Unix on our operating system. The truth is—as a $500 million publishing house—we have extremely diverse

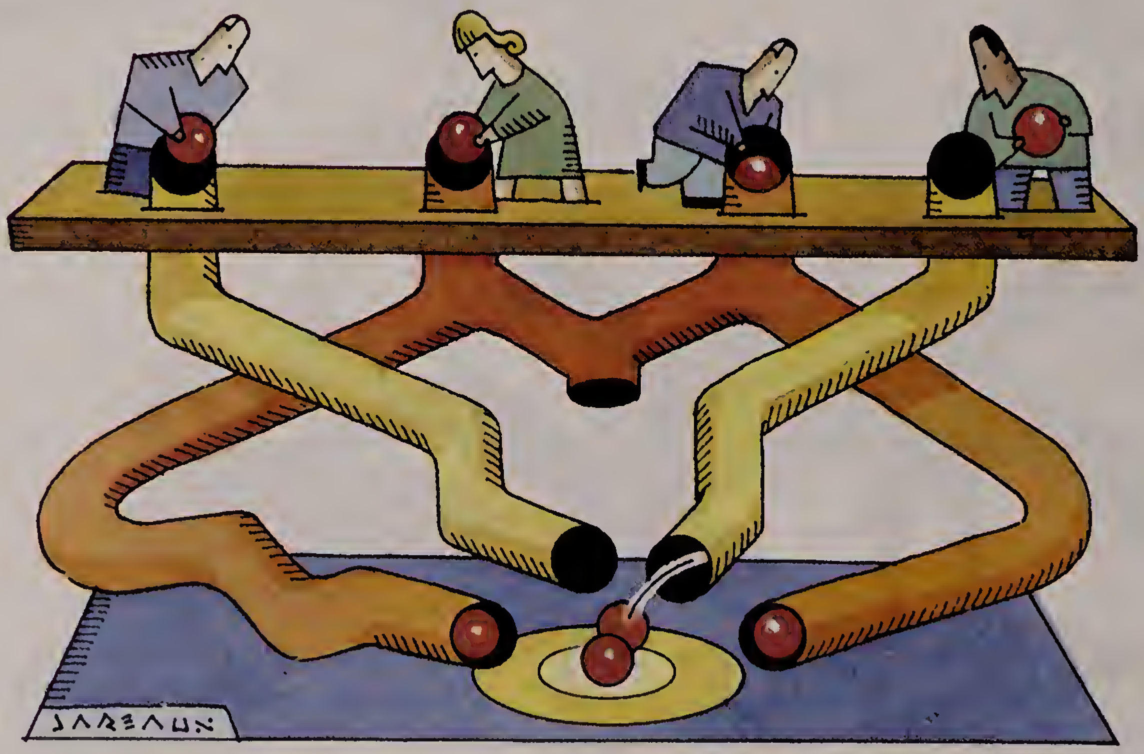

ILLUSTRATION BY ROBIN JAREAUX

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computing needs. In some cases, proprietary operating systems better suit our application requirements.

Our philosophy is simple: We harness open systems whenever it provides us with a quality solution to a specific business requirement. We always look for the best application first, and then (and only then) we bring in the technology that supports it. Very often, that supporting technology is Unix. By adhering to this philosophy (which recognizes Unix's limitations), we get the best Unix has to offer.

Unix directly contributes to our bottom line. In departments ranging from sales estimating to telemarketing, Unix delivers an outstanding price/performance ratio, superior scalability (ensuring a safe, cost-effective upgrade path) and maximum connectivity with disparate platforms installed throughout our entire network.

In today's complex networks, no single operating system can do it all for an entire enterprise. There simply must be room for multiple environments.

Our telemarketing group is a case in point. The 16-person department plays a critical role in marketing our various product lines, which include children's books, games, toys, videos and books on tape. In the past, it relied solely on a word-processing system and traditional card files to track sales contacts and prepare orders. The system was not integrated into the companywide network, and the department's sales information was often dated.

Information is power when it comes to telemarketing (as in so many endeavors). We knew we had to harness new computer technology to free our telemarketing personnel. The challenge was to enable them to focus strictly on contacting customers rather than wasting valuable time on the drudgery of administrative tasks, such as managing card files.

True to our IS philosophy, we first looked for the absolute-best software application, studying in detail the specific needs of the telemarketing group. After a thorough search, we selected an application from Atlanta-based Brock Control Systems that provides broad functionality, including sophisticated sales-order placement capabilities.

Once we found the best application available, we brought in the technology to support it. That turned out

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to be Unix. In this case, a single Unix-based U 6000 server from Unisys Corp. of Blue Bell, Pa., provided all the processing power telemarketing needed. Twelve ASCII terminals hang off the U 6000, which links to our mainframe via Distributed Communications Architecture, also supplied by Unisys.

In our telemarketing department, Unix does what it does best, performing two vital functions. First, it acts as a network communications tool, which speeds data flow throughout the department and the company as a whole. Second, Unix is a dependable application server that delivers fast response times at the heart of one of our busiest networks.

Since it was installed, the telemarketing system has boosted the department's sales contracts by a full 30 percent. Personal productivity has shot up dramatically as well. Before installing the Unix-based server, we considered adding staff to the department to meet a growing workload. However, since we installed the Unix-based system, productivity among our telemarketing employees has shot up by roughly 35 percent. Net result: We no longer need to increase head count, which means we have saved the company money.

Since it was installed, the telemarketing system has boosted the department's sales contracts by a full 30 percent. Personal productivity has shot up dramatically as well.

Very recently, the workload on telemarketing increased yet again—carrying with it a corresponding demand for more horsepower. The scalability of Unix came to our rescue, enabling us to upgrade in a fast, easy and cost-effective manner. We simply traded up to a more powerful server in the Unisys U 6000 product line. That upgrade took us a matter of minutes. In the future, if we decide to move to a different vendor's product, Unix will let us accomplish that effortlessly. By selecting Unix, we have effectively removed the vendor from the equation.

We're reminded again of the age-old moral in *The Three Billygoats Gruff*: Like most companies today, we can't afford to be tied to a single vendor. Nor can we afford to put all our eggs in one basket. CIO

David Brantingham is director of computer operations and technical services at Western Publishing Co. Inc. in Racine, Wis.

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THE AT&T TEST KITCHEN

BY MEGAN SANTOSUS

The dozen or so people in the tastefully appointed room could have been watching TV in the comfort of their own homes. They lounged on sofas, surrounded by lamps, coffee tables, carpeting, plants and refreshments. The only thing missing was a fight for the remote; all present had been provided with handheld devices to control the cable boxes connected to their color television sets. As the viewers operated the devices, occasionally fumbling with unfamiliar buttons, a video camera recorded their every move.

The trials AT&T's Bell Labs conducts in its Consumer Laboratory let the company test the waters of the telecommunications market before launching new products

These viewers—"typical consumers" all—were participating in an experimental session staged at the Consumer Laboratory, part of the service concepts & business analysis department within AT&T's Bell Laboratories in Murray Hill, N.J. This particular group had volunteered to try out prototypes of a video-on-demand service. Data collected from interviews with the participants and analysis of the videotapes led to current market trials of a viewer-controlled cable-television (VCTV) system in 300 Denver-area households.

THE CONSUMER LAB *makes its home in 8,000 square feet of specially designed experimental space featuring observation areas and four bays where experimental situations are simulated. The technology infrastructure is sophisticated and includes interactive voice response, speech-recognition units, satellite- and cable-television hook-ups, and audio-visual equipment. Raised floors conceal wiring for local area networks, high-speed data networks and integrated services digital network (ISDN) capabilities. Movable wall panels are configurable to create any kind of simulated environment, such as a living room or a kitchen.*

PHOTOGRAPHY BY PETER VIDOR

The modest structure at the rear of the Bell Labs complex gives little indication of the strategic work being conducted inside. Yet within the confines of Building No. 5, home to the Consumer Laboratory, an eclectic technical staff of 75 is trying to extract from the mass of data it collects—including its own testing and research results and other sources—a consumer demand that AT&T can satisfy with a product, service or feature enhancement. "We consider ourselves to be

"We consider ourselves to be internal strategic consultants. Basically, we are in the business of uncertainty reduction."

–John A. Greco Jr.

internal strategic consultants," says John A. Greco Jr., head of the service concepts & business analysis department. "Basically, we are in the business of uncertainty reduction."

The uncertainty AT&T wants to reduce concerns what the business can afford to offer and what the consumer will buy. Researchers well-versed in economic and industry analysis focus on the business case and financial implications of bringing new concepts to the marketplace. But first, a real consumer need for a product must be perceived.

Researchers tap into customer expectations by analyzing market and other data. For instance, the company's marketing information management system (MIMS) contains significant comments and complaints made to AT&T's 800 number. In a typical month, the company might receive 100,000 such calls. "This is the most valuable source of information because it comes directly from our customers," says Ramesh Lakshmi-Ratan, technical manager of the new-services identification group. "It gives us a good idea of how we're doing as a business."

Making sense of the textual data stored in MIMS requires language-based retrieval tools that search for patterns in syntax. "By analyzing the data, we can detect emerging issues," explains Gerry Ramage, supervisor of the economic-modeling studies group. This is helpful in defining new-product opportunities as well as finding problems with existing products. For example, when the word "ten" occurred in numerous customer complaints, analysts were able to determine that a recorded message was at fault. Callers were instructed to enter their "PIN," which many misunderstood to be "ten." The message was rerecorded to state "personal identification number," and the complaints dropped off. "Without rules-based systems, we never would have seen a pattern in perhaps 800 calls out of 100,000," says Ramage.

New-product concepts begin with the analysis of such data and with ideas generated in the business units. But the department really learns what consumers want—and are willing to pay for—by going right to the source. In the Consumer Lab, researchers build simulations and prototypes of products and invite consumers to participate in hands-on testing. "It's here where we can listen directly to the voice of the consumer," says Greco.

The Consumer Lab represents a fundamentally different approach to traditional market research, which relies heavily on interviews and surveys. AT&T's need for richer information arises from the nature of its industry. "The difference between the telecommunications industry and other industries, such as packaged goods, is that we have a greater investment risk," explains Lakshmi-Ratan. The introduction of a major new telecommunications product often requires a new infrastructure as well—for instance, providing video services requires a fiber-based network. To avoid making bad investments, "it is necessary for us to have more interaction with consumers....We don't invent new applications; our consumers do. We facilitate what they want."

But it can be difficult for consumers to fully grasp the concept of a new telecommunications product or service without actually trying it out. While the Lab does conduct focus-group studies and field surveys, AT&T believes that the most accurate way to gauge consumer interest is by staging experiments that mimic real-life situations as much as possible. "To bring uncertainty down to acceptable levels, we've found that the best predictor of behavior is behavior," says Lakshmi-Ratan, who points out that Bell Labs has learned this lesson from experience. "In 1969 we predicted that the market for videophones would be more than $1 billion by 1980. We were a little bit off."

The breakup of AT&T in 1984 signaled the start of the extremely competitive telecom-

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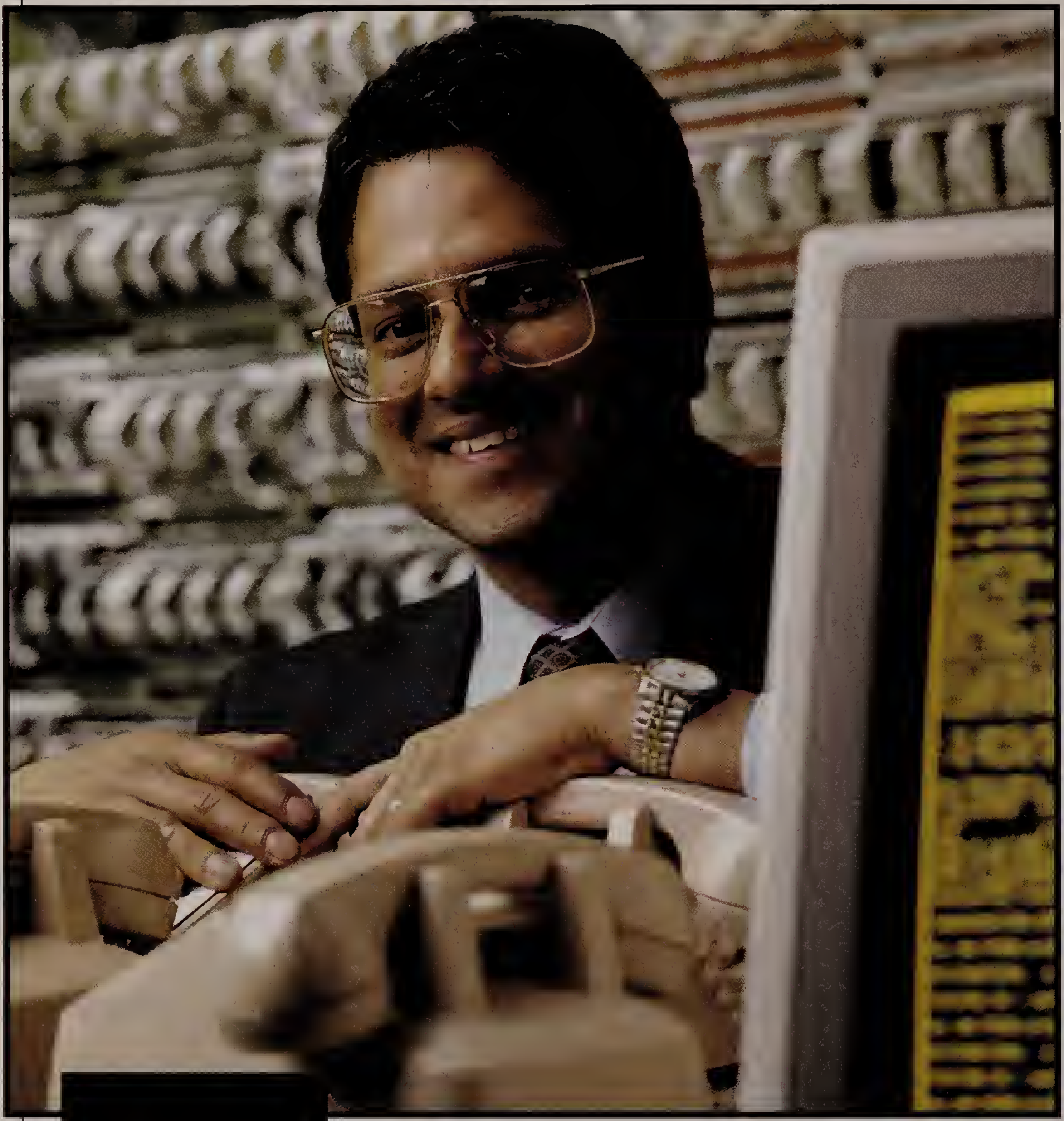

"We don't invent new applications; our consumers do. We facilitate what they want."
–Ramesh Lakshmi-Ratan

munications market. At that time, researchers with diverse backgrounds who had been scattered throughout Bell Labs were gradually brought together in a group that would become the service concepts & business analysis department. Greco refers to the multidisciplinary staff as the "Noah's ark of Bell Labs." More than 75 percent of the department's members have advanced degrees in areas including business administration, communications, computer science, industrial engineering, math, physics and psychology. The collective talents of the staff support the Lab's varied activities, from concept development to product launch.

The Consumer Lab comes into play primarily at the front end of the product-development process. Once a concept for a new service or product reaches the design stage (see related story, Page 48), the necessary hardware and software prototypes are rapidly developed by in-house engineers. Researchers experienced in behavioral and marketing sciences conduct experiments with consumers to determine the usability of and potential demand for a new concept.

"There are all sorts of human-factors issues that are hard to predict," says Lakshmi-Ratan. "In terms of products, consumers have differences in style, taste and [ability to deal with] complexity. We try to take that into consideration when we test a concept." The Lab also looks for test participants whose lifestyles would likely accommodate the new product. An experiment involving personal communicators, for example, is meaningless if it involves consumers who rarely travel or don't need anywhere/anytime communications.

A typical experimental session at the Lab involves 10 to 15 people placed in identical environments within a single bay. The participants can see each other, and a moderator can observe them all. Each test subject has the same setup, including equipment, lighting and seating. They go through structured exercises designed to replicate real-life usage or situations. For example, they might be required to follow several steps in order to place a call on a videophone. "They are asked to do something, and then they answer questions afterward on a computer-assisted survey system," explains Lakshmi-Ratan. The question-and-answer sessions are completely automated so that data gathering is consistent and unbiased.

Experiments are also videotaped to guard against inconsistencies in the findings. "Consumers often don't realize when they are having problems," Greco explains. "They may have some difficulty initially, but then the experiment goes fine, so their overall impression is a good one. By capturing every bit of interaction, we can learn of some problems that we may have otherwise missed." In addition to computerized survey systems and videotapes, feedback is gathered from evaluation forms and discussion groups.

The Lab strives for reality in every physical detail, right down to using either incandescent or fluorescent lights. Occasionally, the Lab's obsession with authenticity works too well. During one experiment, coffee was poured into a realistic-looking sink that had no plumbing. To be on the safe side, a pail is always kept handy.

The department also conducts market research in the field when it is warranted. For example, staff members ventured to Walt Disney World to test TeleTicket, a pre-

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> **"We can take our research on the road or set up blind simulations off-site."**
>
> *–John A. Greco Jr.*

paid information and calling service aimed at foreigners visiting the United States. A magnetic-strip debit card allows visitors to prepay for news and travel-information services as well as long-distance calls; it is currently available in multiple languages.

"We do experiments wherever it's most logical," says Greco. "We can take our research on the road or set up blind simulations off-site if we want." Field-research projects have involved hundreds of thousands of consumers and led to the development of several products that are currently on the market. The Reach Out America long-distance calling plan, for example, resulted from an experiment in Illinois involving 650,000 households.

Direct interaction with consumers provides AT&T's business units with valuable data, but it's not the only source. "We deal with 100 million households," explains Lakshmi-Ratan. "Each phone call is like a transaction that contains several pieces of data, such as time of call, length of call or whether the call was operator-assisted." Every year, billions of such pieces of data are collected, and analysts within the department are kept busy trying to extract information that can be useful to business units. Greco concedes that finding relevant information can be like looking for a needle in a haystack. The Lab hired astrophysicists to help attack the problem because they are comfortable analyzing huge amounts of data.

Still, while decision-support and modeling-management tools have enabled researchers to keep up with the data, Greco feels there is more work to be done. "We're trying to turn the data into useful information, then knowledge and finally wisdom," he says. "That's the way we can ensure that we are offering the best products for the consumer."

Reality Check

. . . .

AT&T's Consumer Lab keeps development projects on track and within the bounds of feasibility

When Conrad Paulus's enthusiasm needs reining in, he knows he can count on the researchers at the Consumer Laboratory to help. "I consider myself to be a mercenary product developer, a professional champion," says Paulus, whose official title is district manager of product development for AT&T's Consumer Long Distance Division in Basking Ridge, N.J. "I tend to be overly optimistic about new products, so it's the people at the Consumer Lab who really invoke a level of discipline into the development process." If the Lab cannot quantify a value to the consumer, development of a new product will be halted. "They prevent us from making bad goofs," Paulus asserts.

Paulus and his business unit have been working with the Lab for six years. He finds that the Lab is most helpful in identifying potential mistakes early in the development process. The Lab's emphasis on trying out new concepts with consumers in simulated environments is ideally suited for the types of products and services his business unit offers, he says. "Traditional market research works well if we are asking customers about making changes to an existing product. The Lab helps us come up with the design [concept] itself, and that's where it becomes very valuable."

During market trials, the business unit feeds data to Lab researchers, who determine the impact of the new product on the marketplace. This information is then used to support filings with the Federal Communications Commission. The Lab's team approach is also instrumental in preventing "feature creep," or the tendency to add features after the initial product concept has been developed. "The danger," says Paulus, "is that we might start by developing a wheel and end up selling a ball."

A team of researchers at the Lab locks into an original concept and follows it through to launch. John A. Greco Jr., who heads the department that runs the Lab, refers to this as a "stage-gate" process. There are six steps in the development of a new product: concept development, market assessment, design, creation of business cases, product development and launch. "Everything is analyzed at the end of each stage for feasibility," Greco explains. "We work together to evaluate progress, and if the development is still feasible, it continues."

According to Paulus, cycle times are down by 50 percent in three years, which helps save the business units money. Rework time—eliminating bugs and feature creep—is down 25 percent. (Paulus attributes these improvements in equal measure to the Lab and a new product-development initiative.) However, the ultimate beneficiaries, says Paulus, are the consumers who get products and services when they want them.

–M. Santosus

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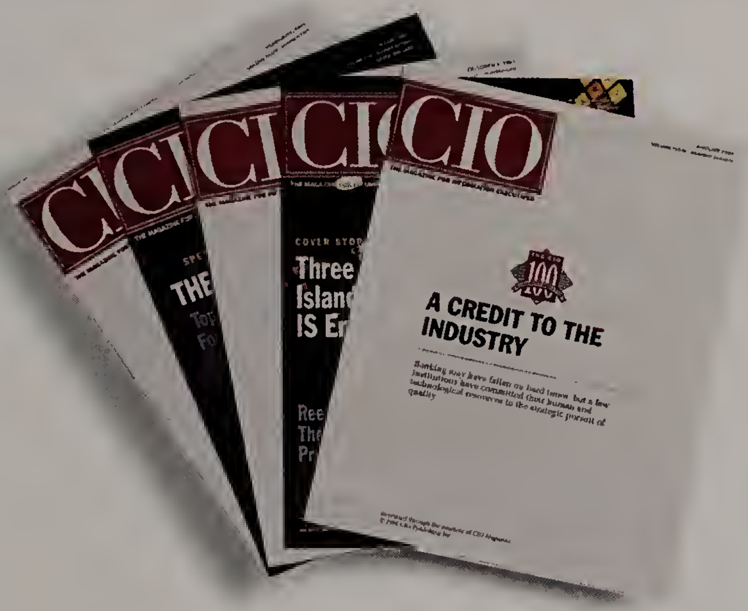

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JIM NOBLE: *"We wanted to stick with what we do best."*

TRAFALGAR SQUARED

OR, HOW TO BE MUCH MORE THAN THE SUM OF YOUR PARTS

TRAFALGAR HOUSE ENGINEERING, the world's third-largest engineering and construction organization, adopted the model of the virtual corporation as a competitive strategy in the late 1980s—not because it wanted to pioneer a concept, but because it had to. Trafalgar House PLC (the parent company of Trafalgar House Engineering) had the bad fortune to overextend itself just as recession hit. In a period of about four years, the London-based company doubled in size, through growth and acquisitions, until it ballooned to 180 locations in 30 countries. Meanwhile, during the real-estate boom of the 1980s, the

STORYLINE

As recession gripped the European economy, Trafalgar House PLC—a diversified collection of firms in the construction, commercial real-estate, shipping and hotel businesses—struggled to stay afloat. This challenge was complicated by the fact that the firm had grown steadily, by expansion and acquisition, throughout the 1980s and, by the end of the decade, consisted of 180 small, autonomous local offices in 30 countries. The many far-flung outposts made for ineffective communication and collaboration. Vying for major contracts with competitors whose resources were more highly concentrated was a daunting proposition. Searching for solutions, management turned an organizational liability into an asset, using open-systems global networking to become a virtual company.

BY NANCY HITCHCOCK

PHOTO BY PETER JORDAN/LIAISON INTERNATIONAL

DAN STITES: *"We've eliminated redundant overhead costs."*

PHOTO BY JOHN RAE

company invested heavily in commercial property developments. When real estate took a downturn, so did the company. As economic conditions plummeted, Trafalgar House found itself deep in debt following acquisitions at premium prices and subsequently declining property values. While revenues from the engineering and construction side of the business remained steady, the company's overall profits were declining.

Migrating to client/server was a challenge in itself, but complicating matters was the company's commitment to preserving a significant degree of divisional autonomy.

"The financial state of the company had got to a level of desperation," says Paul Beaufrere, a diversified-industrials analyst with London-based stockbroker James Capel and Co.

To hoist Trafalgar House out of its slump, senior management decided that the company should concentrate on its strengths, which it identified as the engineering and construction divisions. "Many companies in this situation move away from core business to fill the voids; but we wanted to stick with what we do best," says Jim Noble, director of information technology. Management then decided to target the global client. Although the company did conduct business around the world, it wanted to increase the number of major contracts from multinational clients, where clients may want to design a facility on one continent, have a manufacturing site built on another continent and a plant built on another. Bringing in additional business from around the globe would enable Trafalgar House to even out the peaks and valleys of business and help it construct a path out of its precarious position.

There was one big problem, however. The structure of the company, a complex organization consisting of many small sites, made it difficult to serve multinational clients. A small office of 100 people could not handle the sorts of billion-dollar contracts typical of large construction projects. Trafalgar House thus faced a built-in disadvantage in competing against rivals with resources concentrated in a few very large offices.

Management concluded that the only way to outdo the competition was to turn the company's structural liabilities into assets (or, as Noble puts it, "making a feature out of necessity"): By linking all of its locations together, using an open-systems-based TCP/IP global network, the small, far-flung sites could draw on the expertise of employees around the world, enabling any site to accept a contract of any size. The whole of the corporation would become greater than the sum of its parts. And it would offer something the competition could not: the ability to present a local face to its clients anywhere in the world.

The stakes of this strategy were high. "We decided we had to do this regardless of how

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much it cost us, within reason," says Noble, "because if we didn't, and our competitors did, then we would be out of business. It's as simple as that. So we realized this was life or death. It was not just a cost-benefit analysis; it was survival."

THREE YEARS LATER, the company is not only surviving; it is gaining share in a market that continues to shrink, owing to the weak economy. As a result of implementing the network, Trafalgar House is now sharing expertise among 52 sites in 14 countries. (By the end of this year, 80 sites are expected to be connected.)

Operating as a virtual corporation has increased in-house efficiencies, cut costs and shortened project cycle time, says Noble. Several suppliers and contractors are also linked to the company, streamlining projects even further. Trafalgar House then passes these benefits on to its clients by providing higher-quality projects, at a cheaper price, in a shorter time frame.

In the past, when small offices accepted large contracts, they often had to hire up to 40 percent of their workforce as temporary employees. This was not only expensive; it was inefficient. Temporary staff required more training and kept projects from moving ahead quickly. In addition, these locations would have to draw on the expertise of people at other Trafalgar House offices. These experts wound up traveling to the project site even though they were needed for only a fraction of their stay.

> **"Rather than needing five experts on five projects in every office, we can have one set of experts spread around the globe."** –DAN STITES

"These are all very real costs, whether it's time, actual out-of-pocket costs or more people," says Dan Stites, senior vice president and general manager of Northeast Operations at John Brown Engineers and Constructors Ltd., a member company of Trafalgar House Engineering.

Management had earlier attempted to style itself as a virtual corporation, but it did so without implementing technology to support the concept and, thus, didn't achieve the desired results. Five years ago the company tried to take advantage of a low-cost, English-speaking labor force in India, establishing an office in Bombay. But communicating with other offices was extremely slow—especially since collaborative project work usually traveled by courier. As a result, instead of contributing to the growth of a global business, the office worked primarily on smaller local projects.

Because of this, Trafalgar House recognized that to create a united organization it needed the flexibility of a networked client/server environment; yet applications were operating on a legacy infrastructure consisting of a dozen mainframes. Migrating to client/server was a challenge in itself, but complicating matters was the company's commitment to preserving a significant degree of divisional autonomy.

According to Noble, management decided it couldn't mandate standard systems for use by subsidiaries—many of which have very deep roots in engineering, having been in business almost since the dawn of the indus-

TECHNICAL PROFILE

Trafalgar House PLC is a diversified, U.K.-based, $6 billion international company whose businesses include engineering and construction, commercial and residential property, and shipping and hotels. Trafalgar House Engineering employs about 25,000 people and consists of four main businesses: John Brown Engineers and Constructors Ltd., Davy International, John Brown Engineering and Trafalgar House Offshore.

John Brown Engineers and Constructors provides customers in the process industries with design, engineering, management and construction services. Founded in 1837, John Brown employs over 12,000 people around the globe. Davy International, established in 1830, provides services in the metals industry. John Brown Engineering serves the international power-generation business, and Trafalgar House Offshore is a fully integrated offshore contractor in the offshore oil and gas industry.

Hardware: A client/server architecture, based on Novell LANs, includes 8,000 IBM-compatible PCs; nearly 1,000 CAD workstations, which include Silicon Graphics' 3-D systems; and more than 150 corporate Unix servers consisting of machines from Sun Microsystems Inc., Data General Corp. and Hewlett-Packard Co.

Software: The majority of applications are developed in-house using Oracle Corp.'s CASE tools; database-management systems are from Oracle; CAD software is from Autodesk and CAD Centre; and PCs run Microsoft Windows

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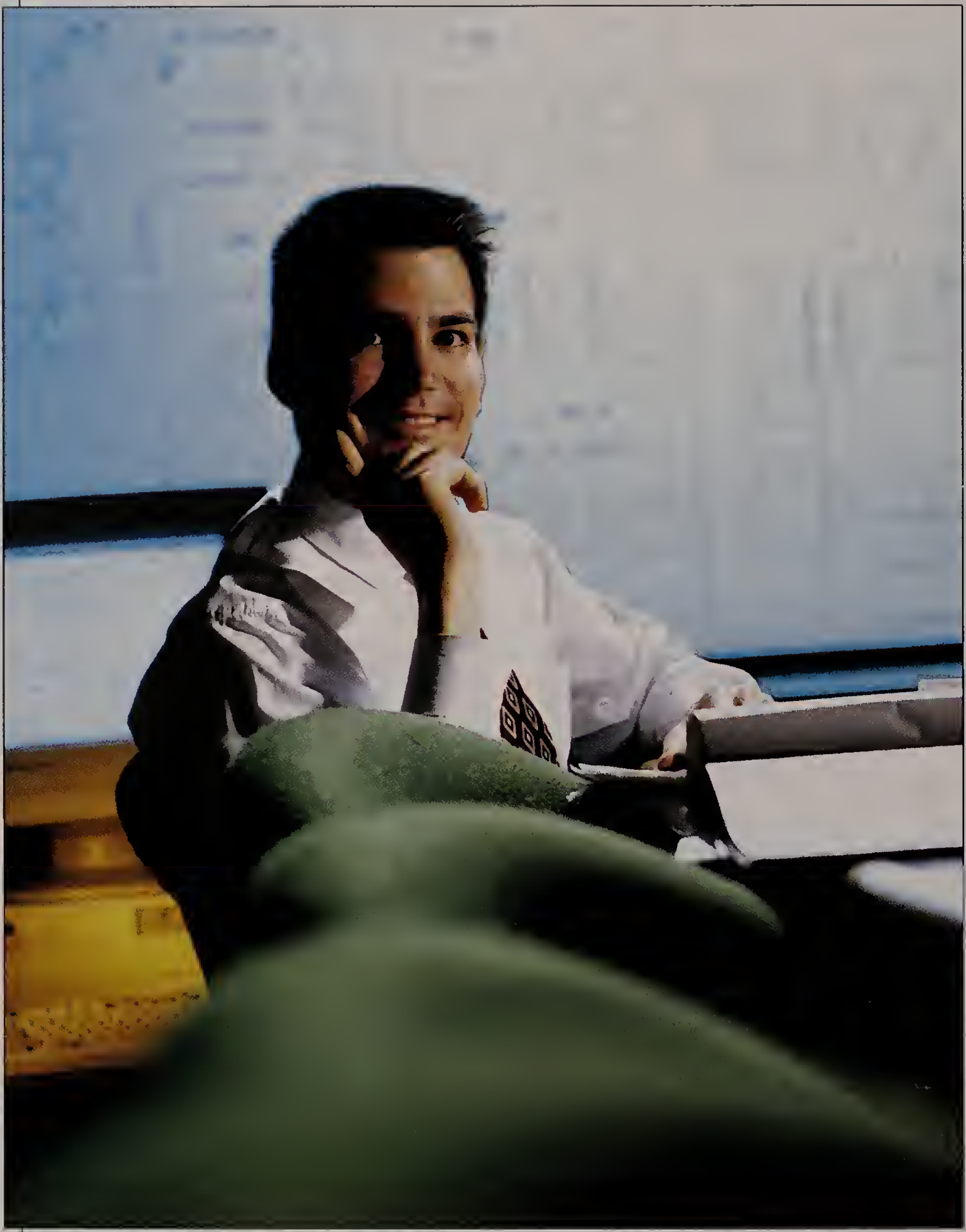

DON OAKES: *Ongoing client feedback saves engineers time and effort.*

PHOTO BY JOHN RAE

trial age. (One Trafalgar House company made the steel for the world's first steam engine, Stevenson's Rocket; another built the ocean liner Queen Mary.) Not wanting to jeopardize the unique strengths of these independent companies, Trafalgar House settled on linking the sites together with an open-systems network.

Since it could not find a commercial system to meet its requirements, the company developed its own high-speed network. Today, this global wide area network, called John Brown International Network (JOIN), enables client/server computing among 8,000 PCs, nearly 1,000 CAD workstations and over 150 corporate Unix servers around the world. Employees send and receive computer-to-computer data, electronic mail and facsimiles; participate in videoconferencing; and communicate over the telephone, all via the network.

"The vision hasn't changed, but the practicality of it has," says Noble. "Now, with open systems, our offices are seamlessly integrated with the rest of the business. [The network] has transformed India [along with many of the company's other remote outposts] from operating autonomously to being an integral part of our worldwide office."

TODAY, TEAMS of engineers from around the world work together on projects as though they were sitting next to each other. A home-grown open-systems database of up-to-date project information is instantly available to all team members, eliminating the time-consuming process of delivering drawings in hard copy to numerous people. The technology also flattened the organization by empowering employees with information, eliminating the need for layers of management. "I'm a lot happier with this system because I know where to go to access information; I don't have to depend on going through six layers of bureaucracy," says Don Oakes, process engineer. "It's much more expeditious now."

After creating a conceptual design, the process engineer releases the drawing simultaneously to all of the other design disciplines (to add specifications for such components as piping, instrumentation and mechanical systems). Designing on 2-D CAD systems (from Autodesk) and 3-D CAD systems (from CAD Centre), these engineers work concurrently, saving a significant amount of time.

For example, in designing and constructing a plant for a pharmaceuticals company in New Jersey, Trafalgar House needs to draw upon the expertise of an engineer in Portsmouth, England. That engineer can now join the team electronically, and drawings can wink back and forth in seconds. Likewise, the design for the plant's steel structure can be sent instantaneously to India, where an employee with a Ph.D. in stress analysis audits the work.

Sharing expertise in this way has also cut costs by increasing employee utilization. Now, employees can work half the week in one country and half the week in another without ever leaving their home offices. "We've eliminated redundant overhead costs," says Stites. "Rather than needing five experts on five projects in every office, we can have one set of experts spread around the globe. For example, if a metallurgy expert was needed to serve a project in Houston and a similar expert was needed in Europe—but each was needed only 30 percent of the time—we would previously have had to hire two people. Now we can hire just one."

Drawing on resources within the company benefits the whole organization. By creating accessible resources for the busy sites to draw upon and making use of people's time at idle locations, the virtual strategy balances out the workflow. Another advantage of working globally is that while employees work around the world, projects make progress around the clock. "You'd think that working in different time zones would be a problem," says Oakes, "but actually it's a plus. We could leave at night and come back in the morning, and the problem could be solved."

When designs are complete, they can now be sent electronically to construction sites. As a result, communication between designers and the site is much faster and more efficient. Construction employees can be confident that they are working from the latest drawings—which is crucial, considering that mistakes made at the construction stage cost 10 times as much to remedy as at the design stage. "It used to take ages to correct problems," says Noble. "And if construction is held up, that costs a lot of money."

> **"You'd think that working in different time zones would be a problem, but actually it's a plus. We could leave at night and come back in the morning, and the problem could be solved."** –DON OAKES

Clients can also become team members on a project. At the outset of a job, clients send their original drawings to Trafalgar House electronically rather than as hard copy. Engineers access the drawings and begin work immediately. This eliminates the need to re-input the design, expediting the process and

Two's a Crowd

Once Trafalgar House's IS group became virtualized, Jim Noble became a majority of one

As the virtual-corporation strategy penetrated Trafalgar House Engineering, it had a dramatic effect on the central information systems department: What once had consisted of 466 people collapsed down to 1: Jim Noble, the IT director.

Noble explains that the chain of command in the IS department had previously been very long, but that the time came to shorten it dramatically. "The only way to be in touch with the business issues and pressures is if you have a flat organization," he says. "It was incredibly difficult, but incredibly essential to change. The whole company is very dynamic and prides itself on its forward-looking vision. So it would be ridiculous to have an IS department with its heels dug into a hierarchical structure."

It became less necessary to maintain a large central department as the company, in one year, migrated its applications off of 12 mainframe systems to a client/server environment. The majority of the IS people relocated to local offices and were retrained to operate the open systems. Two mainframe computers containing administrative and commercial applications were outsourced to a third-party contractor that retained about 50 of Trafalgar House's employees.

Today, when the company launches enterprisewide IT projects, virtual teams share the workload. A handful of IS people in several sites work on project modules, and the teams communicate via videoconferencing when necessary. Teams are managed by a "super user" instead of an IT person. Providing a leadership role for companywide projects, Noble ensures that technology is being linked to business needs and manages budgets for these projects.

Over the past three years, three major systems have been developed and are being implemented to support the company's vision of linking processes, workforce and strategy. They include a global wide area network called the John Brown International Network (JOIN) that today links 52 sites in 14 countries; common engineering systems called Engineering Information Systems (ENGINES) that permit concurrent engineering by integrating engineering data with all other necessary applications; and a fully integrated project control system called Strategic Control of Project Elements (SCOPE).

–N. Hitchcock

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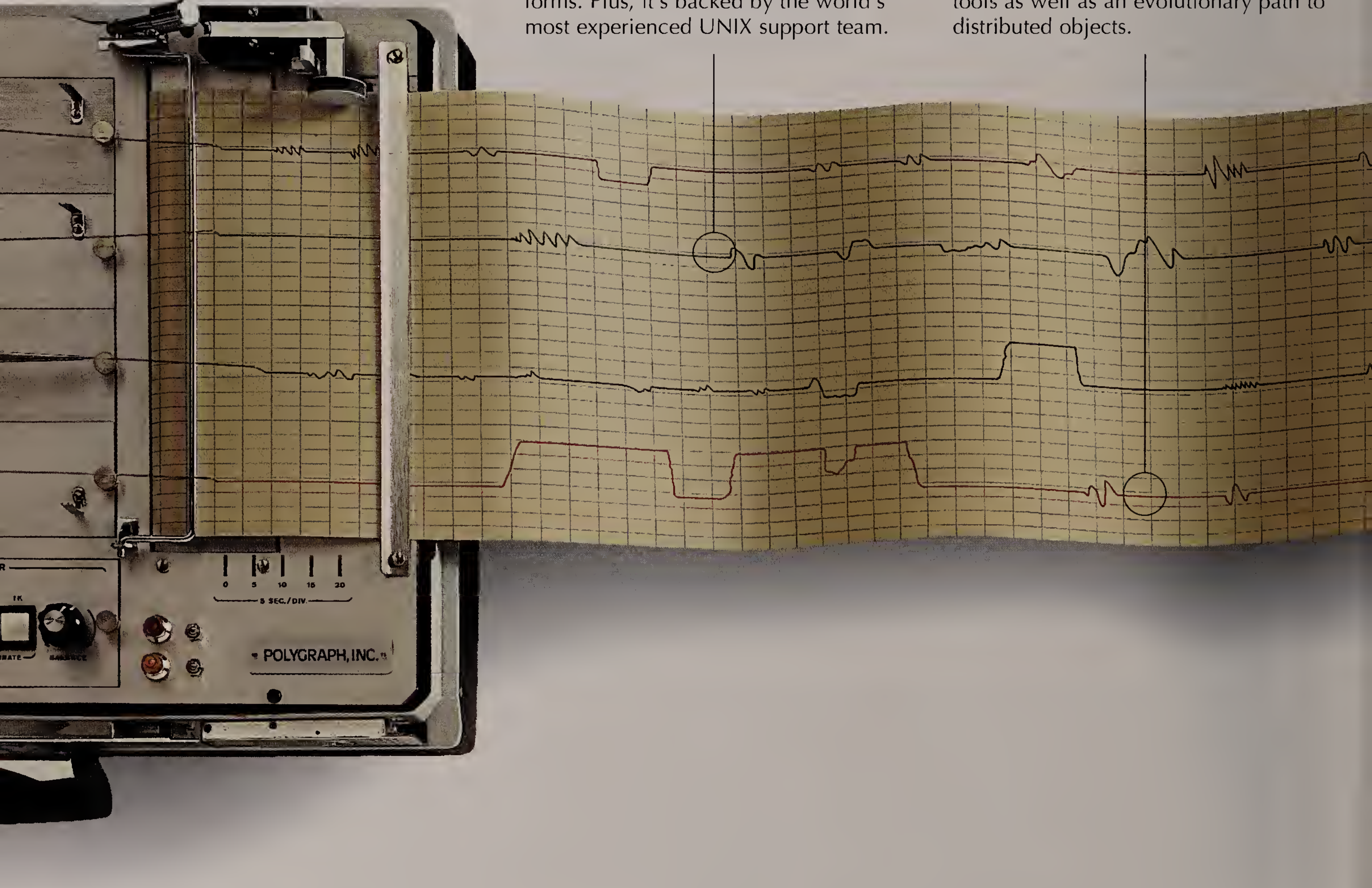

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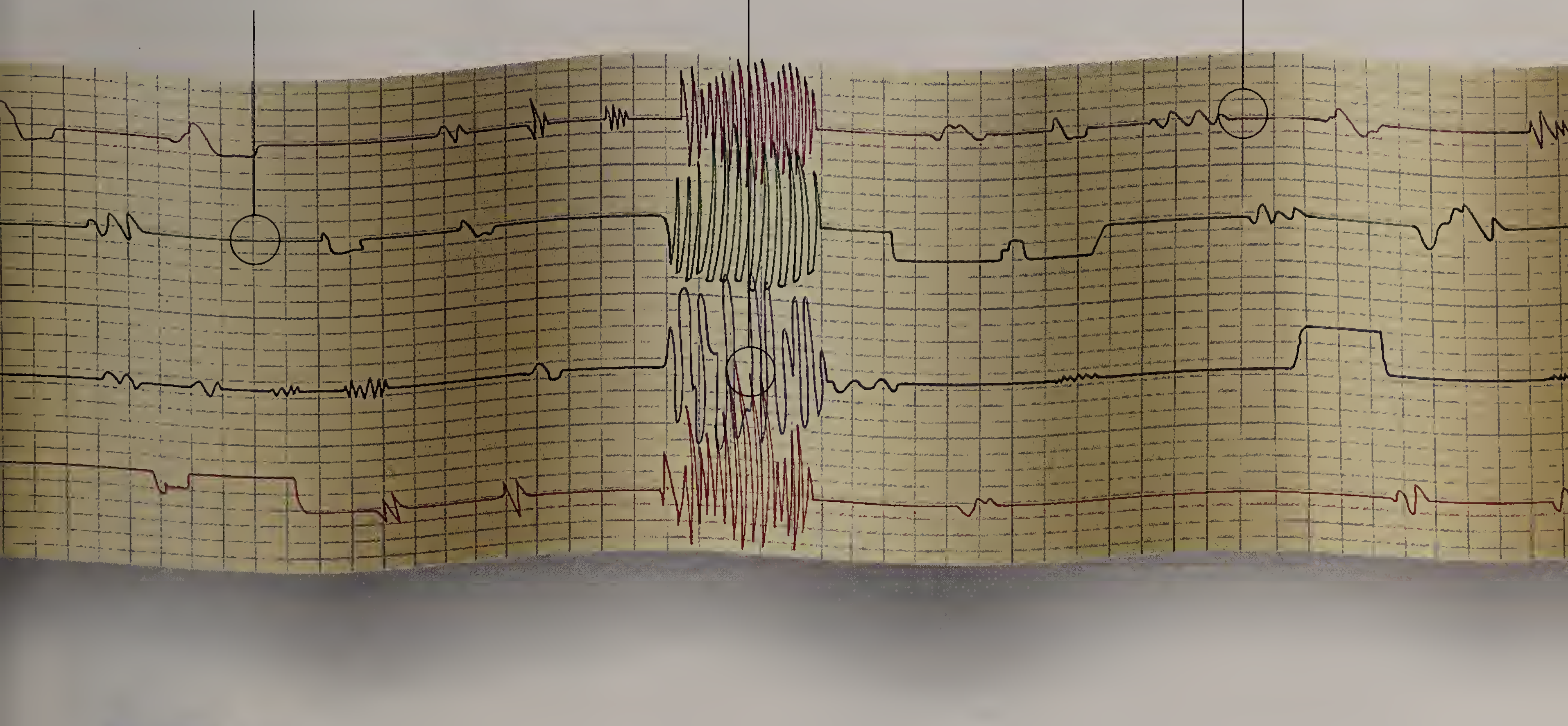

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reducing errors. By interfacing seamlessly and consistently with Trafalgar House, clients are much more involved with projects from start to finish. As a result, communications are strengthened and a partnership develops.

Customers can also monitor their projects on an ongoing basis rather than waiting for weekly or monthly status reports. "Clients feel more comfortable in working with us because they have better insight into our work as it progresses," says Noble. Forming a partnership smooths the progress of a project because engineers and clients review the same information on the same database. Engineers appreciate clients' immediate feedback. "It's actually an advantage to the engineers because if the client has a comment on something while it's in progress, it's much better to know as soon as we possibly can," says Oakes. "Then we don't waste the effort on developing a design based on old information."

> **"Clients feel more comfortable in working with us because they have better insight into our work as it progresses."** –JIM NOBLE

With engineers and clients monitoring a project's progress together, the team detects errors faster, culminating in a higher-quality project. "In a normal contract you often allow 10 percent of total value for rework," says Gregory Kowalski, project manager. "In recent contracts, that number has fallen to less than 1 percent, through fewer misunderstandings, fewer data errors in keying in information and less materials wasted through inefficient design."

This increased efficiency has enabled the company to reduce project cycle time (measured from the start of engineering through construction) by over 20 percent compared with traditional methods. "Shorter time scales are extremely important to the pharmaceuticals industry, for example," says Noble, "because as soon as the FDA approves the drug, then the client wants to build the plant and wants the product out in the marketplace yesterday. So our ability to respond extremely quickly and have that plant up and running faster than the opposition is vitally important to us.

"So if a company had just invented a new heart drug," Noble continues, "and it gets the product out there four months [faster], that makes a very big difference to the amount of money the company makes from its R&D."

Trafalgar House's ability to compete on price can make the difference between winning and losing a contract; but there can also be a more subtle impact. For example, major oil companies are extracting less oil because of the current low price of crude oil, Noble says. The costs of opening new wells cannot be justified. "Now, we don't like that," says Noble, "because it means we don't get the project work to design and build the oil rig. So what we're trying to do is use information systems to reduce the cost of designing and building an oil rig, therefore making it economical to extract oil from the ground. That's a win/win situation. We get the project work, and the client gets a cheaper job." In fact, he says, these efficiencies won the company a $400 million job to design and build an offshore oil rig that otherwise would not have been built.

RESTYLING ITSELF along virtual lines has endeared Trafalgar House to its customers and kept the company competitive. "Clients are really impressed with what we can demonstrate," says Oakes. "They see it as one of our strengths. That's really what's proving that the virtual corporation is a worthwhile endeavor."

Seizing strength from the entire organization, each small site can present a bold face to the client. "To the client, the organization is transparent," says Joseph Cozza, VP of engineering for John Brown's Northeast Operations. "We really are one united organization even though we are geographically dispersed."

Although the strategy, with information technology at the core, has increased the company's market share, it has not yet increased profitability. Trafalgar House still operates at a loss, and the company has replaced upper management and refinanced several times. Nevertheless, management and analysts are confident that the firm is on track to turn itself around. "When Europe comes out of recession, Trafalgar House will be in a strong position to take advantage of new opportunities," says analyst Beaufrere.

Having now laid its virtual foundation, Trafalgar House can concentrate on more-literal foundations: of bridges, manufacturing plants, offices, oil rigs and roads.

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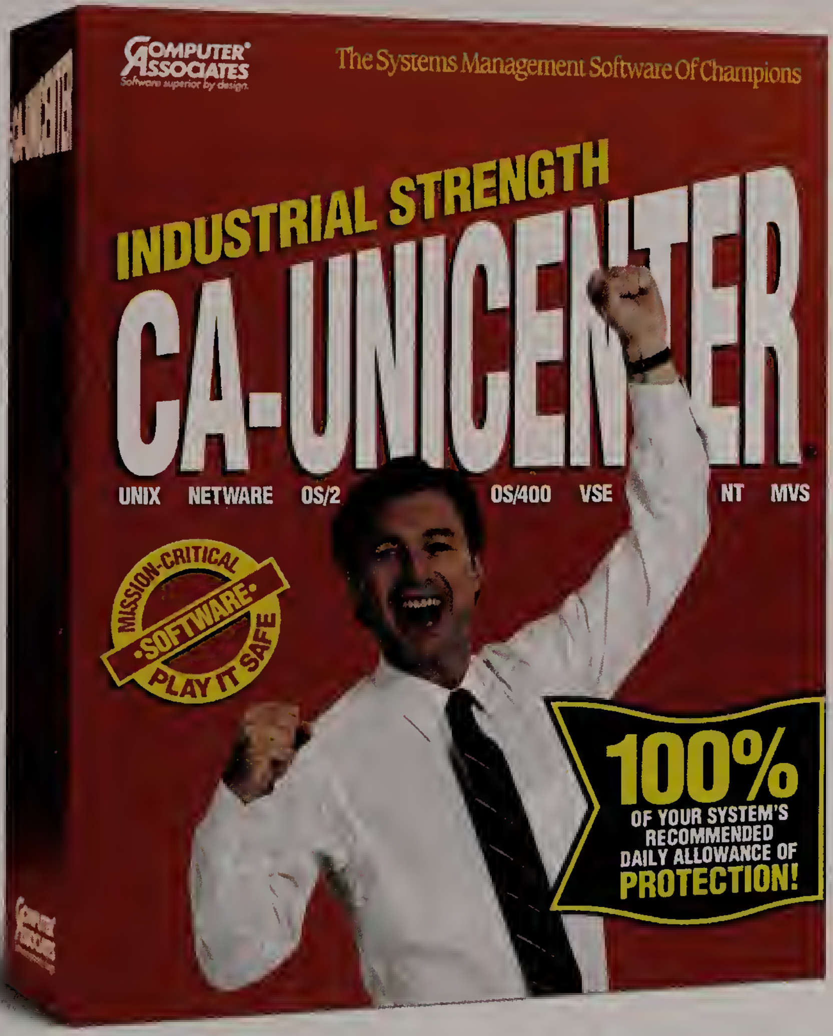
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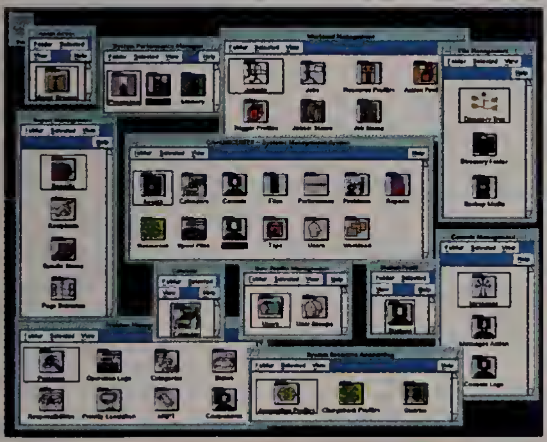

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The Patent Trap

Critics say that flaws within the U.S. patent system leave software makers' investments at risk and quash the very progress the system was created to promote. What does this mean for you, the customer?

BY LEIGH BUCHANAN

IN THE LAST SIX MONTHS, the U.S. Patent and Trademark Office (PTO) has come in for the kind of angry criticism normally reserved for Congress and the IRS. Most of the drubbing has come from software companies that criticize the patent system for failing to protect their investments—or, in extreme cases, for crippling the progress of the industry. Despite all the ruckus being raised by vendors, however, little attention has been paid to how patents affect the companies for which information systems are a critical operational tool. But make no mistake: If your company buys, develops or uses software, the patent system can touch you in significant ways.

Consider the case of OPEB Funding, a business unit of The Prudential Asset Management Co. Inc. (a wholly owned subsidiary of The Prudential Insurance Co. of America), based in Newark, N.J. In 1987, OPEB began development of a product that funds retiree health benefits through a life-insurance trust paid into by employers. The unit's IS group developed software to perform the underlying calculations: premium contributions, investment returns and the like.

Three years after OPEB began offering the product to its corporate customers, a company run by one of the firm's former brokers emerged with a patent—not only on the system itself but on the business processes enabled by that system. According to Prudential's assistant general counsel, John DeWald, Premit Group Inc. of New York has demanded a maximum of $58 million in royalties and has warned Prudential that it may sue the company.

"The description of his system includes lots of stuff that the insurance industry has done forever," says Charles Morgan, vice president of OPEB Funding. "He patented all this stuff that looks like a system when his real objective was to patent something that's inherently unpatentable—a life-insurance policy."

Premit has also approached both existing and potential customers of the product to warn them of the dispute. "He's suggested that we're going to owe royalties, and they ought to watch out for our trying to pass that cost back to them," says Morgan. "And if indeed we *are* responsible for paying the royalties, we *will* pass the cost back because we can't afford not to."

Premit President Fred Van Remortel defends the patent's validity, arguing that he has been proselytizing the funding of retiree health-care benefits since 1984 and performed all the original tax, legal and accounting research underlying that approach. He emphasizes that the patent covers not software but a computer system, and cites previous court decisions that have upheld similar patents. And to Morgan's complaints that the company is spooking Prudential's clients, he responds that "some of their customers are our customers, and we talk to our customers on a continuing basis."

As for the $58 million figure, Van Remortel says he doesn't

ILLUSTRATION BY TED PITTS

know where it came from. “In discussions that we have had with companies,...the licensing and royalty costs associated...are very minimal,” he says. “All we want to do is see that people who are using our computer system play by the rules.”

The Prudential case highlights two of the chief complaints about the patent office: It issues patents that are too broad and frequently fails to uncover prior “art” (evidence that an invention already exists or has been used or publicized prior to the patent application). The life-insurance patent is especially troubling, suggests DeWald, because it ropes in fundamental business processes. “If it’s not patentable without a computer because it’s a method of doing business, then simply sandwiching a computer system in there shouldn’t make it a new product,” he says.

The problem, just about everyone agrees, is that the Washington-based PTO issues too many software patents that fail to meet the agency’s standards. To qualify for a patent, an invention must be “new”—meaning that it cannot have been previously known or used. And it must be “nonobvious,” meaning that someone ordinarily skilled in that technology wouldn’t have logically been able to come up with the same invention. “It really requires a spark of genius,” says Bruce A. Lehman, assistant secretary of commerce and commissioner of patents and trademarks. “You don’t want [patents] granted on every little advancement in technology that any technologist could have thought of. And there’s a lot of criticism that we’re granting patents indiscriminately on just these increments of inventions.”

> **The enemy of your software vendor is your enemy as well. Vendors socked with infringement claims will either have to pay royalties or become embroiled in expensive litigation. Inevitably, they will pass some of that cost on to their customers.**

Morgan and others point out that what happened to Prudential can happen to other financial-services firms—or indeed, to any firm that develops a technology solution without first checking every conceivable source to make sure someone else hasn’t done it first. “Developing a large program is like taking a long trip through a minefield,” says Richard Stallman, a Cambridge, Mass., software developer. “Even if each step is probably not going to [trip] a mine, the chance that you’ll make it through the whole minefield without stepping on one gets lower and lower.”

SYSTEMS LICENSED FROM A software vendor are even more vulnerable than those developed in-house because they are more in the public eye. For that reason, the enemy of your software vendor is your enemy as well. Vendors socked with infringement claims will either have to pay royalties or become embroiled in expensive litigation. Inevitably, they will pass some of that cost on to their customers, industry members say.

Not only can companies end up paying higher prices, but they may also become litigation targets themselves, simply by virtue of having used the disputed software in their organizations. In the late 1980s, a programmer named Paul Heckel initiated a patent-infringement suit against Apple Computer Inc. over its HyperCard product. When Apple didn’t ante up, Heckel began contacting HyperCard users, including EDS Corp. Apple eventually settled. “What Apple got for its money,” according to Stallman, “was a promise that users would not be sued for using the patented techniques on Apple computers.”

Then, a few years ago, an inventor named Roger Billings sued both Novell Inc. and one of its biggest customers, Bank of America, over a patent he holds on a database file-server system. Bank of America settled; at press time the suit against Novell was still creaking forward. Carey Heckman, co-director of the Stanford Law and Technology Policy Center in Palo Alto, Calif., and a former Novell employee, says he sees no validity in Billings’ claims and believes that Bank of America “probably shouldn’t have had to pay. But I’m sure its legal fees were outrunning what the whole thing was worth to it.”

Most recently, in a much-publicized trial last February, a jury found that Microsoft Corp. had violated a patent held by Stac Electronics, a small firm based in Carlsbad, Calif. In a decision that many expect will be overturned, the jury awarded the claimant $120 million after determining that MS-DOS 6.0 appropriates Stac’s patented data-compression technology. “By virtue of this decision, every single individual and company using a copy of DOS 6.0 is in violation of Stac’s patent and can potentially be sued,” says Jim Warren, a member of the board of directors at Autodesk Inc. in Sausalito, Calif., and a vocal critic of software patents. And if for some reason you are reading about the Microsoft case for the first time in these pages, tough luck—“you have just become a knowing infringer and that makes you liable for triple damages,” Warren says.

There are other considerations besides expense that make litigation an unpalatable choice. Prudential’s Morgan believes he’s legally on terra firma, but he still fears the vagaries of the U.S. court system. Litigation “creates bad press for a firm like Prudential, and it’s not predictable,” he says. “You could see how this would be portrayed: as the big bad insurance company against the little entrepreneur.”

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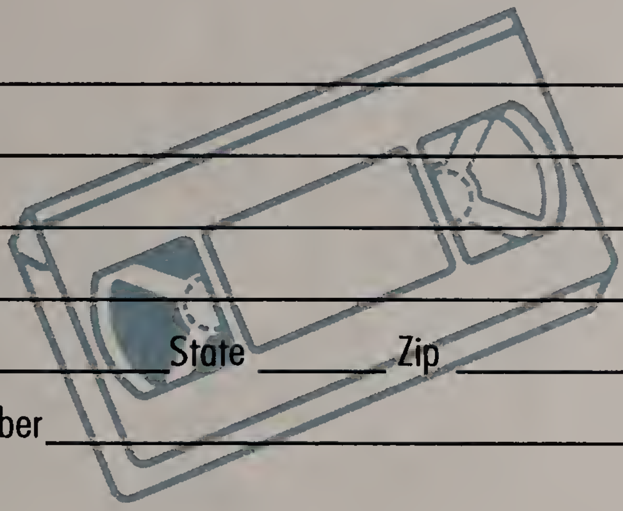

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Software patents can also have a depressing effect on vendors' abilities to quickly provide new products—ironic, considering that the patent system was created to promote progress. "I think that you will see the pace of innovation slow down," says Douglas K. Brotz, principal scientist at Adobe Systems Inc. in Mountain View, Calif. "Companies are going to be more cautious about the things that they bring out, and they're going to be less efficient in the way they produce their products." That's bad news for user companies, which may find it harder to acquire the IT solution they need when they need it.

Patents can also retard progress by diverting talented scientists from the creation of new products to the defense of existing ones. Brotz is one casualty of the industry's desire to gird itself against attacks. He began his career at Adobe by writing most of the code for PostScript Interpreter, the company's flagship product. But for the last two years, Brotz has spent nearly 100 percent of his time researching prior art and advising the company's patent attorneys on methods to fend off infringement claims. "There are some intellectual challenges in the patent field, so it hasn't been a total loss for me," says Brotz. "But I would truly rather be creating systems and promoting progress than defending Adobe against useless claims."

Patent Truths

User companies that develop their own software can follow some "safe business practices" to help decrease the likelihood that they will be sued for patent infringement, according to Carey Heckman, co-director of the Stanford Law and Technology Policy Center in Palo Alto, Calif.

What they don't know can't hurt you. If your company has developed software exclusively for in-house use, the best strategy is simply to keep quiet about what you are doing, says Heckman. "If it's truly in-house and there's not a lot of visibility on how the [system] is working, you probably don't have much to worry about."

Ignorance is not bliss. If your company is eyeing outside markets for its IT inventions, it must take the same precautions as any software vendor, Heckman says. These include thoroughly examining the prior art to make sure that it isn't treading on any toes. Companies can hire outside experts to perform this research: The U.S. Patent and Trademark Office publishes a directory of registered attorneys and agents, and there are listings in the *Yellow Pages*.

Forearmed is forearmed. Heckman recommends that companies be aggressive in developing their own patent portfolios. "Patents are now part of the proprietary-rights protection arsenal," he says. "One of the best defenses against a bad patent action is to have something to trade. That way, if someone comes after you, you can negotiate a cross-license that says, 'You license this to us, and we'll license you this other juicy thing.' "

An insurance safety net? A number of companies have begun offering insurance against patent-infringement suits, but Heckman has qualms about where this might lead. Companies indemnified against litigation might "go out there and do whatever they wanted because they're covered," he explains.

–L. Buchanan

THE ISSUE OF SOFTWARE patents erupted into prominence last fall, when Compton's NewMedia, a publisher of multimedia titles based in Carlsbad, Calif., announced that it had patented a system that included many of the most popular techniques for searching multimedia databases. The news was greeted with a general gnashing of teeth and beating of breasts by software vendors that claimed the patent was broad enough to suffocate the infant multimedia industry in its crib. They also rebelled against Compton's plan to seek royalties on products that used these techniques—a strategy that reports say could be worth hundreds of millions of dollars to the patent holder. (In March, the PTO made a preliminary decision to withdraw the patent; at press time, the ball was in Compton's court as the agency awaited its response.)

The intensity of industry angst prompted the PTO's Lehman to call for a review of the patent—an unusual move for the traditionally passive agency. Lehman is quick to admit that the system is flawed—and even quicker to promise reforms. "The Bush administration had an advisory committee look at this; they concluded there was no problem," he says. "How they could have come to that conclusion...I don't know. But we have heard the message."

Much of that message came through at PTO-sponsored hearings last winter, where programmers, patent attorneys and other interested parties delivered sometimes impassioned testimony about the system's weaknesses. What emerged was a general consensus that the patent system must be changed and sharp divergence over just how much reform is necessary.

Most of the attorneys present at the hearing, as well as some major vendors, continue to support software patents as long as the system for issuing them is improved. "Patents serve a valuable purpose in attracting investment to worthy technologies, particularly technologies like software where without the protection the investment would not be viable," says Steven J. Henry, a patent attorney and partner at Wolf, Greenfield and Sacks in Boston. Henry argues that the problem lies not in patent law but in the PTO's lack of human and technological resources, which prevents it from ex-

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haustively investigating an invention's originality.

At the other end of the spectrum are purists like Stallman, who want software patents eliminated altogether. "There was plenty of progress before they started patenting software," says Stallman. "The idea that patents are doing some good...is total speculation."

> **"Patents serve a valuable purpose in attracting investment to worthy technologies, particularly technologies like software where without the protection the investment would not be viable."**
>
> *–Steven J. Henry*

Autodesk's Warren, whose company has been hit by 17 patent claims in recent years, agrees that the system is not doing its job where software is concerned and asks that these products be given special status. "The legal community has a real problem with that, creating an exception to a nice, neat collection of rules that they're comfortable with," he says. "But the rules don't fit the software industry, and we sure as hell are not comfortable with them."

Stanford's Heckman, on the other hand, warns that creating special rules for software could distort the way technology develops in the future. "You may see people unnaturally doing things in hardware that they ought to be doing in software because they want patent protection," he explains. "That may ultimately backfire on the industry."

USING THE TESTIMONY IT gathered at the hearings, the PTO has prepared a slate of reforms. Many involve dragging the agency into the computer age, both in terms of how it operates and what it considers patentable. Lehman's office is illustrative of the agency's new outlook: a sleek and Spartan counterpoint to the fusty storerooms bulging with yellowed—in some cases, crumbling—documents that form the core of the more than 200-year-old department. These patents—more than 5.2 million of them—are being entered into the agency's 8-year-old automated patent system, which allows examiners and others to do quick, key-word searches for examples of prior art. (The process is a slow one: PTO employees are inputting documents at the rate of about 2,300 per week; only patents going back to 1971 are currently online.)

But just providing electronic access to the agency's patent-document repository won't be enough. Because software has been deemed patentable only since 1980, the PTO lacks the bank of historical information that exists for other types of inventions. Many examples of IT prior art reside in company manuals, technical reports and other scattered publications, few of which are available electronically or otherwise.

Lehman says his office is committed to giving examiners better access to nonpatent literature, and a number of private organizations are trying to help by supplying documentation. Chief among these is the Software Patent Institute (SPI), a nonprofit association of concerned industry members based in Ann Arbor, Mich., which recently put online a database of about 10,000 records from various sources. But while the SPI—with cooperation from major vendors—has made progress, "it is a large task and probably should be considered the responsibility of the PTO," says Henry.

Another reform the agency has adopted is hiring computer scientists as patent examiners for the first time in its history. Examiners traditionally "were supposed to be in electrical engineering or mechanical engineering—the older disciplines," says Richard LeFaivre, vice president of advanced technology at Apple in Cupertino, Calif., and a member of the SPI's executive committee. "Computer science was new and people weren't really sure about it, so they held off." Lehman, who calls those notions "archaic," began recruiting computer-science graduates last winter. He says that initially the new hires will serve as technical consultants, but they will eventually be assimilated into the examiner corps. The SPI is also developing a training program for currently employed examiners to improve their knowledge of the relevant disciplines.

Another change being considered would require the agency to publish patents before they are issued. That would give the public a chance to challenge dubious patents, an opportunity that does not exist under the current system. "Currently we do not require people to give up trade secrecy until they know for sure that they are going to get protection," says Lehman. "Now we're opening up a little window." The agency will also work with the courts to help them better interpret the criteria for judging what is patentable.

Lehman says that as a result of these changes, the number of software patents issued will drop (he would not estimate by how much) and their quality rise. That should help restore credibility to the country's intellectual-property system, which he insists remains essential to spurring technological innovation and protecting U.S. interests in an increasingly complex global marketplace.

"The wealthy nations are going to be the ones that develop new technologies and then develop legal systems that assign value to the buying and selling of those technologies," he says. "The only thing that gives them that value is the intellectual-property system, and that's why it's going to be incredibly important as we move into the 21st century."

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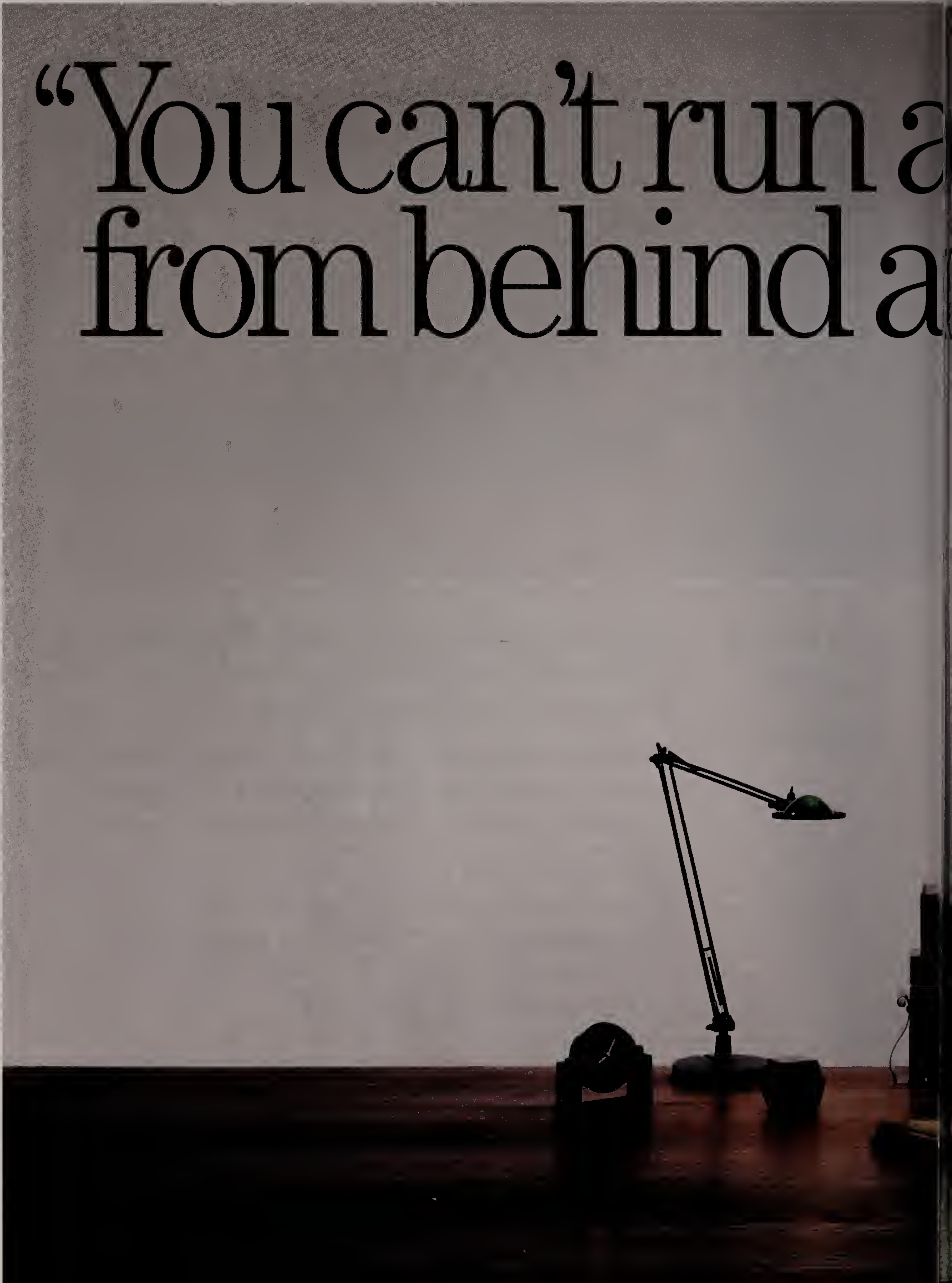
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REDEFINING MOMENTS

IS departments seeking to redefine their service strategies need to stop relying on old assumptions, look at what they're doing now and listen to what their customers expect from them in the future

BY RICHARD PASTORE AND
CAROL HILDEBRAND

THE SLOGAN "WE TRY HARDER" works for Avis, but it's not likely to win over IS customers. There's certainly room for improvement in IS services at Federated Mutual Insurance Co., but trying harder to be all things to all people is not the answer, insists Rebecca Dawley, vice president and director of business information services at the Owatonna, Minn., firm. "I think we're trying to be overresponsive, to our detriment," she says. Instead, Dawley wants to step back, rethink the services her department offers and find a new strategy that works better.

Dawley's department is in the earliest stages of service redefinition, and she knows that one of her first jobs will be to convince her staff that things need to change. "They are aware of the customer complaints, but we often get caught in a loop of trying the same things over again whenever there's a problem," she notes. "We need more self-contemplation." The hurdles here include an ingrained bias against outside ideas and an aversion to rocking the boat in this close-knit organization.

Dawley also knows that her internal customers must play a major role in defining the new service strategy. She has set up an interdepartmental group to help align IS priorities with Federated's business plans. The group, which includes user representatives from claims, marketing, administration, accounting and underwriting, has already raised awareness of IS service options. But the group is not completely representative of the company's business lines, and its status within the firm is rather low.

To remedy this, Dawley has invit-

SUBJECT

Federated Mutual Insurance Co., Owatonna, Minn.
Industry: Commercial, personal, group health and life insurance
Revenues: $800 million
Total employees: 2,600
IS staff: 180
IS executive: Rebecca Dawley, vice president and director of business information services

OBJECTIVES

- **Redefine the services IS offers—better aligning them with customer needs, enhancing their business value and improving customer-service quality**
- **Determine which IT services should be retained and improved and which should be outsourced or shared with partners**

CONCERNS

- **Who should participate in redefining the service strategy, and in what capacity?**
- **How do we obtain user and management involvement and commitment?**
- **How should we increase awareness of IS as a service provider?**
- **How can we decide which services to**

PHOTO BY STEVE NIEDORF

REBECCA DAWLEY: *"I think we're trying to be overresponsive to our detriment."*

ed Federated's COO to champion the cause by raising the status of the group and encouraging user management to be more forthcoming with their time. "A couple of years ago, this would not have worked," Dawley says. "Now management is more inclined to participate, though there are limits. I think our COO will help them find more time."

Dawley also wants to benchmark service strategies against other companies that operate in the rigid regulatory climate peculiar to insurance and banking. Allstate Insurance Co. of Northbrook, Ill., for example, has physically placed IS staff members in user departments to put them closer to customers' service needs, she notes. Along these lines, Federated IS staff members have begun attending business-unit meetings.

As to specific IS services, Dawley acknowledges that while there might be some sacred cows, "everything should be subject to review." Her group

emphasize and which to eliminate or outsource?

- **How might we overcome hurdles such as the not-invented-here bias and IS staff resistance?**
- **What standards or metrics can we employ to measure service levels?**

STEPHEN C. FINNERTY
Johnson Controls Inc.

JERRY LOEV
CSC Impact

ROBERT J. LETO
Unisys Corp.

JAMES R. METZGER
Texaco Inc.

may not be the logical source for some services; instead, outsourcers or external or internal partners might be more appropriate providers. For example, should IS be handling PC application training when there are so many training firms and software vendors with that expertise? Network management might become a cast-off candidate too, as it grows in size and complexity.

Though she knows an IS service engine requires continuous tuning, Dawley wants to complete the bulk of the work this year. She hopes some seasoned pit crews can lend her their expertise.

Stephen C. Finnerty, *director of information systems and services, Johnson Controls Inc., Milwaukee*

Like Federated Mutual, we began the redefinition of our IS service strategy with the internal customer, assessing the types and levels of service we provide currently and the customer's future needs. I like the idea that you're getting a strategic dialogue going with customers, Ms. Dawley. Doing that will help you arrive at a shared vision of IS service as it is and as it ought to be. At my previous employer, Scott Paper, we used customer focus groups that discussed the service situation while we sat and watched, not getting involved in the discussion. We learned a lot and made some of the required service shifts based on this process.

I also tried steering committees in the past, and I don't think much of them. They can lead to a "peanut-butter approach" to IT investments, spreading a little bit out for everyone. I think it's more effective to use what we call business-system leaders, individuals who work with and report to myself and the head of a business area. They are part of the business team and provide IS with the customer perspective. Rather than being liaisons, they are enablers, empowered to deliver IS services to customers or seek outside services if they can't get what they want internally.

STEPHEN C. FINNERTY: *"Everything you currently offer should be challenged."*

PHOTO BY DAVE SCHLABOWSKI

In the absence of these people, you should at least be talking to customer representatives. I might also recommend you hire an outside facilitator to help you work with customers. We used Ouellette & Associates, which did a nice job revealing the gap that existed between our customers' expectations and what we could deliver. It was like a slap in the face, and I think that would help you convince your IS staff that things really do need to change significantly. [Ouellette is a consulting firm in Bedford, N.H., that advises IS departments on improving service quality.]

I'd say you're right in trying to start with a clean slate of IS services. Everything you currently offer should be challenged. First we drew up our criteria to determine whether things should be outsourced, insourced or maintained. Is the service becoming more or less strategic to the business? Can we do it cheaper, faster or better ourselves or by sending it outside? Then we listed 25 to 30 IS products and services including communications services (videoconferencing and voice communications); group productivity products (document management and bulletin boards); infrastructure services (operating systems); and utility services (security and disaster recovery).

We talked about whether the need for these services among our customers was declining or experiencing low, medium or high growth. That determination should be based on customer-articulated needs, as well as on key business trends like globalization, price pressures, workforce diversity and so on. You also need to factor in technology trends because the customer, in many cases, doesn't know what technology exists or what's coming. It's part of our role to illustrate how technology might affect business processes.

You're never sure you've defined your service strategy correctly. But it helps to keep a dialogue open with customers to assess their level of satisfaction. We want measures that reflect improvements in business processes. Our business-system leaders negotiate service-level agreements with customers, and we plan to survey customers against our benchmarks once a year.

We're now at the stage of assessing our IS skill set to determine what training, hiring and consulting help we'll need to deliver new services. We'll follow that with pilot projects for hands-on experience.

I am projecting that the bulk of this process will take us about nine months. Though we always want to do things more quickly, you shouldn't try to push it any faster. Otherwise, you risk skipping or shortchanging important steps.

Jerry Loev, *president, CSC Impact, a division of The CSC Consulting Group, Cambridge, Mass.*

I think that you are entirely correct to be concerned about the products and services IS is offering, Ms. Dawley, but I don't think you're looking at the issues deeply enough. I see several disturbing symptoms in your case study:

- There does not seem to be a clear connection between what you're doing with IS and what the business requires.
- Your steering committee does not appear to be peopled by the real movers and shakers at Federated.
- Executive support seems tepid.
- As evidenced by the "not invented here" attitude in IS, Federated seems like an inward-looking organization, even though the financial-services industry is growing increasingly competitive.

> "Treat benchmarking as a form of competitive intelligence and you'll increase line-business interest."
>
> *–Jerry Loev*

But I think that you can address these problems by following several steps. First, instead of self-contemplation within the IS function, turn your attention outside, to the business functions. The question to ask is, "How does IT service map against key business challenges?" A line-business-unit manager won't care about IS unless your department is driven by business needs. Create a framework of key business initiatives and look at how IS can influence them. For example, if Federated's goals are to reduce underwriting losses or speed claims processing, what can IS do to support those goals? Maintenance support for word processing seems far removed from these challenges.

You can use a slightly revamped steering committee to create that framework. Here's how you need to change your committee: Start by figuring out who your customers are, and get top managers from those

JERRY LOEV: *"Create a framework of key business initiatives and how IS can influence them."*

PHOTO BY KENT HANSON

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functions to participate. If you focus on line management's toughest business problems, they'll have a compelling reason to show up, and you will find out what your service priorities are.

You also need strong buy-in from a heavyweight executive to push your service mission out into the business units. You've made a good start here by getting buy-in from the COO, but he doesn't appear to be offering a very strong endorsement yet. You need a passionate champion. To help get buy-in, concentrate on developing strong working relationships with line-business-unit heads. You also need a couple of your own direct reports who are wired into the rest of the company, perhaps because they have come from the business areas and have a record of accomplishment there.

Panelists' Findings

- Before redefining IS service strategy, determine what products or services are provided, how they are provided, why they are provided and who the customers are.

- Evaluate IT efforts in business terms to help convince reluctant IS personnel that changes are needed. This also helps win necessary support and commitment from business-side leaders.

- Involve internal customers in identifying needs and evaluating IS service performance. Have them rate both the performance and importance of IS services.

- Empowered IT/business liaisons work better than steering committees in identifying needs, problems and gaps between service performance and client expectations.

- Benchmark against other firms to identify best-of-breed processes for delivering IS services.

- Every existing IS function should be challenged and considered for outsourcing. Demand proof that something *shouldn't* be outsourced.

- Reengineer one or two top IS services or products as a test to gain insight and credibility.

- Be prepared to restructure IS jobs, retool skills and broach the need for process reengineering elsewhere in the organization.

- Assess progress in redefining IS strategy through open client dialogue and formal measurements against benchmarks and service-level agreements.

I like your idea of comparative benchmarking, Ms. Dawley, but take it one step further. Treat benchmarking as a form of competitive intelligence and, again, you'll increase line-business interest. I'm not advising industrial espionage, but you can get a sense of what's happening with operations or upcoming products at other companies by what is going on with their systems. Business leaders may then look at IS as a source of insight or actual hard information, and consider its leaders as business partners. Through comparison with competitors, you'll also learn more about how Federated operates.

Your IS staff is going to rightfully feel threatened by this wholesale change. Respond by throwing a challenge at them. Start with the assumption that everything within IS can be outsourced and have the staff prove to you why each item should stay. If your staff can't service a need faster or more cheaply than an outside provider, then they better have other compelling reasons to keep the service. This will get your staff thinking about the source of their real value. Some staff members will continue to feel threatened, but others will rise to the challenge.

After you've redefined IS services, start with one prototype project. Choose a business executive with a pressing business need, and use this project to showcase the new way of doing business. Try to use rapid application development techniques to deliver results within a dramatically compressed timeframe. A successful project will boost internal IS enthusiasm and give you tangible results that you can build on.

Lastly, don't expect to do everything at once. Your 1994 timetable is a good start, but this is an ongoing process. Patience is needed to build new relationships between business and IS, and those relationships are the key to the success of your service mission.

Robert J. Leto, *director of process reengineering, Unisys Corp., Roseville, Minn.*

Ms. Dawley, you are right on target about the first step in recreating your IS service strategy—recognizing the need to change. Without acknowledging the need for change—and its urgency—you will have limited success in bringing about real reform. Back in 1991, I faced the same situation at Unisys Corp., where I led an IS group in reengineering its mission. [See "Coming Back from the Brink," *CIO,* June 15, 1993.]

You need to understand *what* products or services are provided, *how* they are provided and *who* the customers are. These are the cornerstones of the IS mission you seek to modify. The *what* is aligned to specific needs. The *how* addresses the delivery methods, technologies, processes and qualitative aspects. The *who* is your target market, either your immediate client or your client's customer. Defining these elements will drive, focus and refine the IS service-strategy charter.

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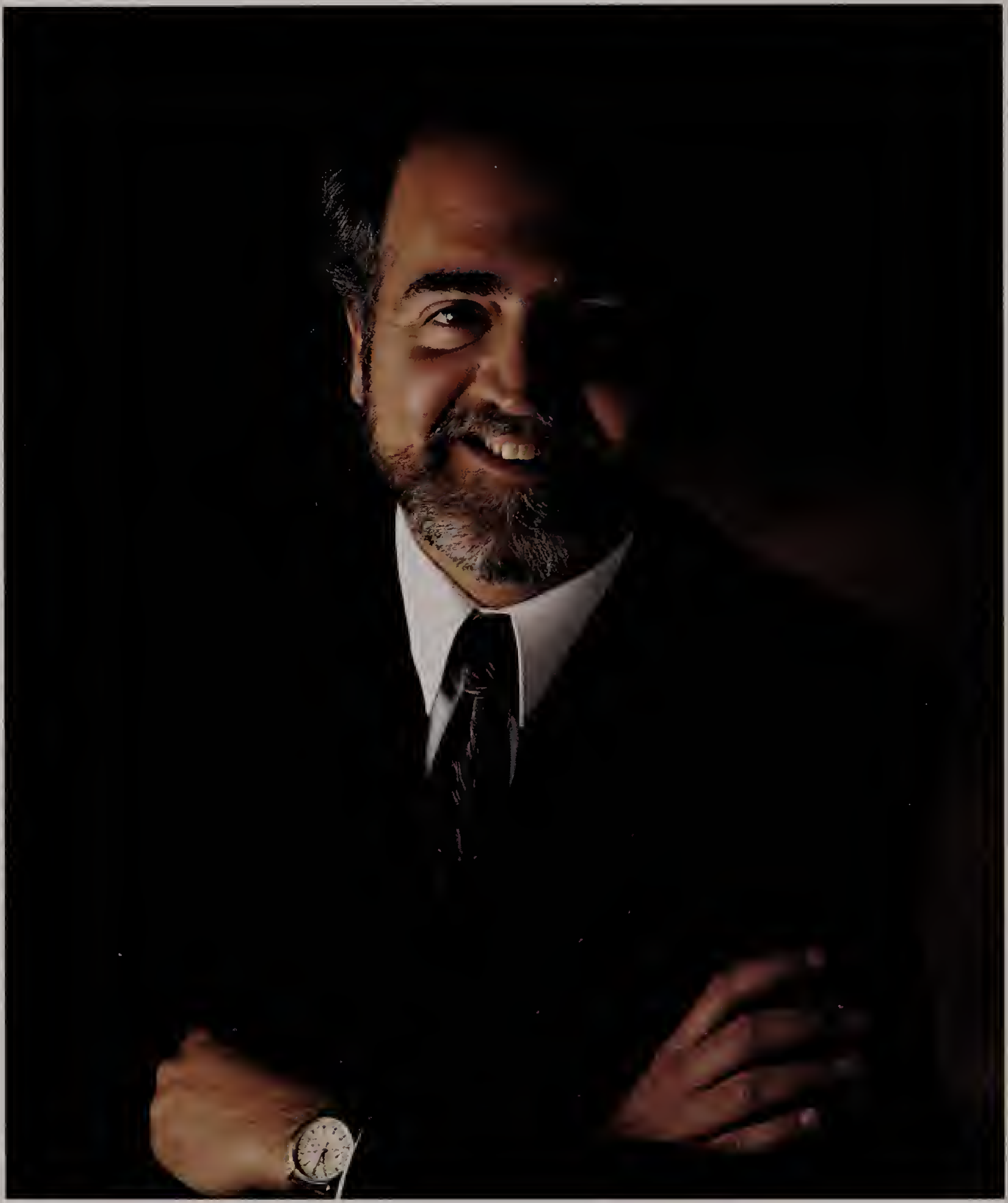

ROBERT J. LETO: *"It's vital to demonstrate organizational competency in these first attempts."*

holders up front. This includes internal IS staff, management, clients, suppliers, customers, human resources, third parties and regulators. Tailor a communications strategy that allows each of these stakeholder groups to provide input to, and receive output from, the change process.

Now add the *why* ingredient. This is IS's driving force, and it must be aligned with company objectives, values and culture. Develop a self-assessment profile (what, how, who and why) for each IS function with the involvement of stakeholders from the function. This will help separate the nice-to-do list from the business imperatives.

> "Have your clients rate service levels by considering the services' importance and performance."
>
> –*Robert J. Leto*

You and your clients have already begun to identify business needs and the IS services required to meet those needs. For each product and service you identify, audit current service levels against client expectations. Have your clients rate service levels by considering the services' importance and performance. Challenge your clients to align the importance dimension with the company's business objectives. This will yield a prioritized list of what IS provides (or ought to provide). For example, users may tell you the get-to-know-Lotus class is topnotch, but the network help desk is not very responsive. But it's the network that keeps the work flowing, so it's the latter service your clients see as more important.

From this, you can build an importance/performance matrix that will identify service-level gaps, highlight opportunities for balancing resources, sort strengths and weaknesses, and provide a basis for negotiating meaningful service-level expectations. This is also the first step in creating your list of outsourcing possibilities.

Once auditing is complete, develop specific action plans to close service-performance gaps. Focus on how the products and services are delivered from the clients' viewpoint. Radical process reengineering may be required, depending on the size of the gaps. Be prepared to take risks. Rocking the boat is encouraged and important at this stage.

Benchmarking can help you here by revealing best-in-class processes for delivering IS services. You can find these benchmarks both inside and outside your industry. They will stimulate problem-solving creativity, zap the not-invented-here skeptics and put a stop to the insanity of continuing to do the same things over and over and expecting different results.

Be prepared to restructure jobs and retool skills to fit the new processes. Your firm's human-resources people can help smooth things out for you here. Involve appropriate

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stakeholders in this action planning, and make sure the change sponsor and agent show strong commitment at this stage to help minimize the inevitable resistance.

With your action plan in hand, you'll be ready for implementation. Focus on the top one or two areas, and throw everything you can into closing the performance gaps on time and within budget. It's vital to demonstrate organizational competency in these first attempts. Credibility here will be parlayed into much-needed political clout downstream. Assuming you pass the test and credibility is established, the organization is in a position to address the remaining gaps.

James R. Metzger, *general manager of corporate planning and economics, Texaco Inc., White Plains, N.Y. (Metzger was recently promoted from the position of general manager, information technology department)*

I think that the hardest part of defining a new service strategy for IS is that you must depend on skills that are not traditional IS strengths. Instead of concentrating on technology, you have to develop and use people skills to overcome cultural resistance to change, both within IS and externally.

We redefined our strategy as part of an ongoing quality initiative that began in 1988, and it was difficult to move from a traditional IS organization to one that is focused outward, on the customer. However, we realized that pinning a new IS service mission onto an unchanged IS infrastructure was a recipe for failure.

Effecting that change involved clearing a number of the same hurdles that you face. One of your stated concerns, Ms. Dawley, is convincing your staff that it needs to change. Instead of more self-contemplation within IS, try teaching your staff to think in terms of the business. At Texaco, we continually develop metrics that measure IT in business terms, such as the IT component of the cost to produce a barrel of oil. We also work with specific business units to develop metrics that meet their requirements. For example, if one unit's most important issue is system response time, we'll measure our service to that specific unit in those terms. We will formalize this with a service-level agreement if that's what our customers want.

How do you figure out who your most important customers are? We started by looking at our internal billing records. Those who paid for our services were our customers. You can't necessarily equate the number of dollars spent and the importance of a customer, but it is a starting point for discussion between service providers and service consumers. The result may be a joint agreement on the relative value of services and therefore their importance to the customer.

> "If you will be using more packaged software and fewer programmers, tell your staff, while also pointing out new opportunities."
>
> *–James R. Metzger*

All this change is pretty frightening to IS staff, so you really need to make an effort to communicate clearly when you talk about your service strategy. First, you have to be totally honest. For example, if you will be using more packaged software and fewer programmers, tell your staff, while also pointing out new opportunities.

Second, people need to see a personal benefit from the changes. You need to understand what drives individual staff members and couch the new program in terms of how it will benefit them personally. Give them a reason to buy in.

Sell the project to the business heads by talking business benefits, not technology feeds and speeds. For example, the head of customer service might not be interested in a new telecom network service if you try to sell her on its technical merit. But if you tell her that you can reduce the cost of every call coming into her department by X amount through your new plan, she'll listen.

Don't shirk spending money on "warm and fuzzy" training issues. This was one of the hardest things for me to do, and I think it's one of the most important. IS employees are generally more comfortable with numerical thinking; many need help learning how to interact. Skills like consensus building are actually very practical when used in the context of self-managed teams.

Lastly, make sure to stock up on your reserves of patience. It's difficult to get people to throw away a business model that they are already familiar with, and it's an ongoing process. But if you do it right, you will see some bottom-line benefits as well as happier customers.

EDITOR'S NOTE

"Second Opinions" takes real-life issues facing real-life information executives and presents them to a panel of experts—IS practitioners, consultants, academicians and non-IS executives—for evaluation and advice. While our revolving panel of experts cannot explore all the possible solutions in this limited space, we hope that by suggesting a few strategies, they may contribute to a better understanding of serious, common concerns. We plan to check back with our subjects to see how they chose to address the issue and to report on their progress.

We invite our readers to offer topic suggestions and/or serve as case studies for future articles. Please contact Richard Pastore at 508 935-4435.

RemoteWare, *and the* CONVERSION OF JARED FARRELL.

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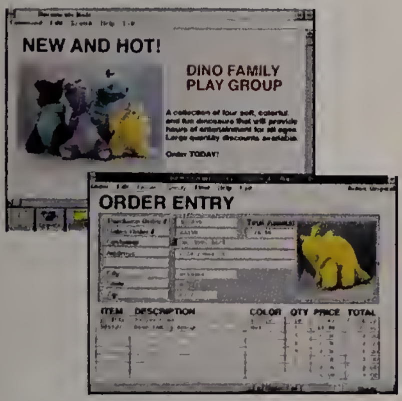
A *skeptic* FROM WAY BACK, Jared Farrell the Salesman had outlived more than one attempt at automating field communications. The near-daily software updates. Nightly communication sessions that didn't. Inventory that wasn't. Prospects that…weren't.

So the fact that something called RemoteWare® had been implemented to automate sales processes for farflung laptop jockeys like himself had held little charm for Farrell. A client/server system built with software tools already happily in use in hundreds of large companies worldwide, with automated dial-up communications for transporting centrally-created electronic forms, documents and reports between home office legacy systems and even the most remote PCs? Terrific. Plus routing and query facilities to make sales-critical information simple to get and easy to use… on the road. Excuse me?



But within just days of the fading hook shot that sent the CIO's announcement memo into Farrell's round file, he was using the new applications electronically dispensed by RemoteWare. Entering daily orders, filing expenses, and penning a humble note of thanks to the CIO, from 30,000 feet. All quietly and automatically delivered by RemoteWare while he slept. A fitting complement to the inimitable selling routine of one Jared Farrell. Indeed.

Now, as he slid into the Central Office Staff Room six months later and five minutes late, Farrell watched the eyes of the room swivel towards him, like half a volley at Wimbledon. And the CIO and VP of Sales were headed his way with…a plaque? "Jared Farrell, Salesperson of the Year," it read. Salesperson of the Year. Imagine that.

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The Data Deluge

Desktop computing and electronic communications are threatening to drown today's knowledge workers in a sea of data. But don't despair: With a little careful planning, managers can help users get to the information they really need.

BY TRACY MAYOR

You're looking into Lotus Notes. The legal department is pushing hard for document management. End users in accounting are screaming for client/server data access, but the management team wonders if an executive information system (EIS) wouldn't be better. Maybe a workflow system is what you need. Or imaging. Or decision support. Or intelligent E-mail agents. Something.

What's going on here? Most likely, you're suffering from information overload. As corporations open up legacy systems to end users, deliver a dizzying array of desktop tools, network departments together and hook into the Internet, workgroups and individual workers alike are becoming awash in a sea of data. Knowledge is a good thing, but too much information can kill productivity and slow the forward motion of a company.

If you're in a buying mood, software companies are rushing to cure the malaise with everything from groupware that "breaks the boundaries of time and distance" to software agents that "reengineer the decision process," all promising to help workers gather, encapsulate, access, update, disseminate and distribute data. But before you commit dollar one, industry consultants, vendors and big thinkers advise that you take time out to consider some intangibles. Visionary CIOs, they emphasize, map out goals, analyze existing business processes, set limits and elicit upper-management commitment—before they even consider investing in a new or enhanced system. If you do your homework, you may even be in for a pleasant surprise: Some managers find that fine-tuning their current systems is all the "new" product they need.

ILLUSTRATION BY BETHANY GULLY

Access Isn't All

With the exception of a few remaining glass-house IS loyalists, most managers agree that the desktop-computing revolution has done much to bring the information to the people. Unfortunately, the revolution in many companies is only half over. Workers still don't have the wherewithal to easily find what they need and apply it correctly to their business problems. "Users say, 'Give me access and I'll be happy,' but that's not really what they mean," says Jeanne Harris, managing director of enterprise intelligence systems at Andersen Consulting in Chicago. "It's not enough [just] to provide data."

Electronic communications make it easier for a wider range of employees to accumulate and issue information, but this in turn creates a higher volume of unfiltered data. "We have data inflation," says Chris Reed, director of Notes market development at Lotus Development Corp. in Cambridge, Mass. "It's so cheap and easy to send E-mail that the information itself gets devalued." To make matters worse, the velocity of the information flow has increased dramatically. "Look at all the new device types—pagers, PDAs,

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video clips, news feeds," Reed adds. "You can't afford not to be connected for any length of time."

A host of consultants and vendors agree that locating relevant data is the No. 1 problem among workers—made worse as the amount of available information increases. "Client/server computing has put lots of databases down on clients, but the major questions are still, 'Where?' and 'What?' and 'How do I get at it?' " observes Carol Blotter, vice president of strategic alliances at Comshare Inc., the Ann Arbor, Mich., maker of Commander EIS software. In many companies, it's only a matter of time before the situation begins to affect productivity and, ultimately, to show up on the bottom line.

Carpe Datum

To truly take control of information, companies must first rethink their information philosophy. "Workers can get carried away with information and lose the connection between information and action," says Thomas Davenport, partner and director of research at Ernst & Young's Center for Business Innovation in Boston. "If you really want to manage the broad information environment, you need to reorient the organization from focusing on technology to focusing on how people work."

That shift is best effected by adding context to traditional data elements such as spreadsheet cells or database fields, Davenport says. Context in this case means that workers receive not just facts but meaning and point of view that will help them make decisions. In many companies, that context is added with newer data types—electronic documents, graphics, video, audio or workgroup databases—and with one very old data type: text.

Any worthwhile information philosophy must also embrace legacy systems. "Every CIO tells me they'd like to blow up every legacy system they have, but there are only a few hundred managers a year who have the corporate culture to reengineer and the $5 million or $10 million needed to do this," says Dave Liddell, manager of brand strategy for IBM Corp.'s Software Solutions division in Somers, N.Y. "Nine out of 10 legacy systems are working satisfactorily," he says, and a successful information system will accommodate them.

Likewise, companies that have made an extensive commitment to particular desktop tools should design a system that allows them to remain active. IBM's Visual Document Library gives networked users a uniform way to archive, locate, share and revise documents created with a wide range of desktop applications. Because the system works behind the applications, capturing documents as they are stored and depositing them on a LAN rather than an individual's hard disk, workers don't need to learn a separate user interface or even be aware they're using another system.

> **"Delivering 100 percent of your data to all people is the same as giving them nothing."**
>
> *–Robin McNeill*

Enter Reality

Once you've thought about the larger issues, analyze your business processes as they work right now, not as you'd like them to work. Observe what kind of information is used, when and by whom, and where it goes next. "Look at the process to identify who owns a piece of data and when and how it travels," advises Mark Ruport, president and CEO of Interleaf Inc., the Waltham, Mass., document-management pioneer. "Some data stays put, other data moves, some within the same department, some from group to group."

Next, zero in on the mission-critical application that has the most impact on the business. Managers should concentrate on improving key processes rather than trying to solve an overall information problem with a large, vague plan. "Think big, start small," says Andersen Consulting's Harris. "Build something that's real that adds business value in three to six months. Transforming your IS department to deliver end-user benefits [can be a] three- to five-year process, but you can deliver something real in a short period of time."

Don't be afraid to set limits. The most common mistake managers make is trying to replicate their companies' entire bank of knowledge in whatever system they're attempting to introduce. "IS people tend to say, 'I have 75 gigabytes on my mainframe; now how do I put it on a desktop?' The answer is, you don't," says Robin McNeill, director of Cognos's line of PowerPlay decision-support tools in Ottawa. "Delivering 100 percent of your data to all people is the same as giving them nothing."

Industry observers generally advise against putting users on a "data diet" by blocking access to knowledge (security concerns notwithstanding), but they do say that corporations should try to help users limit the data deluge. "Encourage standardization and make it so most of the data people need is in one place," says Edward Belove, vice president of software development at Ziff-Davis Interactive in Cambridge, Mass., and the former vice president of corporate research at Lotus. As an example, Belove says he has set up his electronic mailboxes so that all messages land in his Notes Mail mailbox. "Give people the tools so they can standardize and they won't feel like they have to go outside the [corporate information] system."

Observers say that smart agents will play an increasing role in data gathering, going out over the information network and bringing back only those elements that fit sets of rules a user has specified. Comshare has teamed up with Andersen Consulting to develop a detect-and-alert system, Commander Exception Monitor, that Andersen's Harris calls "one of the first products to proactively monitor and deliver manageri-

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al information to end users." Software agents are trained to watch targeted databases for changes, trends or other patterns; when conditions change, alerts are automatically routed through the network to appropriate users or workgroups.

Finally, CIOs should try to ensure that employees will actually use the new or improved information scheme. Upper management must set the tone for the company and establish new behavioral rules governing communication—for example, when is electronic mail appropriate, and when is a face-to-face meeting required? Should documents reside in a Notes database or be exchanged over the LAN as attachments to a messaging system? "We have standard behaviors on when U.S. mail comes in and how we deal with it," says Ernst & Young's Davenport. "We need corporate procedures on when to do electronic mail, voice mail and Notes databases as well."

To engender grass-roots support, IS managers should foster "communities of interest" throughout the organization, says Anatole Gershman, associate partner and director of the human systems integration laboratory at Andersen Consulting's Center for Strategic Technology Research in Chicago. These communities, which can be within a single department or cross-departmental, involve interested "power-user" employees who work with information in the same way. The CIO should provide templates and tools so that people don't have to reinvent the wheel, but should otherwise let the communities take the information initiative whenever possible.

Products Anyone?

Data elements must match the work that employees actually have to accomplish. Imaging and document-management proponents insist that for many companies, those elements involve text and documents, not database fields. An aphorism cited again and again by text proponents holds that only 10 percent of a given company's information resides in electronic databases—presumably leaving 90 percent open to electronic text handlers such as Interleaf's document-management systems, IBM's imaging and indexing products or Comshare's Commander EIS.

Documentum Inc. takes a slight twist on the text approach by breaking elements into smaller parts that can be reused in "virtual documents" as needed. "Our customers want to create the approved version of a particular document, then keep reusing parts," explains Robert Reid, vice president of marketing for the Pleasanton, Calif., firm. Documentum's object-oriented system allows companies to build repositories of elements—text, images, multimedia, video and so on—that are then combined into other electronic documents when appropriate.

To engender grass-roots support, IS managers should foster "communities of interest" throughout the organization.

–Anatole Gershman

Many IS managers, however, are reluctant to sideline traditional databases—particularly when crucial business information still resides in them. One alternative championed by 4GL language firms such as Cognos is to apply Structured Query Language querying tools or a graphical EIS—or both—in front of the databases, making them more accessible to end users.

Richard Hackathorn, founder of the Bolder Technology consultancy in Boulder, Colo., and author of Enterprise Database Connectivity (John Wiley & Sons, 1993), takes exception to the 10 percent data, 90 percent text rule. "In a classically structured database, you want to put only the formal data that is required to support the business processes." That may encompass only 10 percent of a company's collective knowledge, he concedes, but "it's the most important 10 percent."

Some firms looking to give users greater access are building data warehouses—versions of their transaction-oriented databases that are customized for unspecified ad hoc queries needed to support business decisions. In effect, a data warehouse retools a database so that it can be used by people rather than a Cobol program, Hackathorn says.

Consultants, vendors and observers emphasize that no one software system will cure information overload, but they agree that one product currently comes closer than any other. It's no coincidence that even vendors competing with Lotus Notes groupware can or are prepared to interact with it in the near future. Notes offers many elements important to a well-rounded information system—including the ability to mix and match a wide variety of data types, a uniform interface that lets people access disparate data types in a uniform way and malleable data repositories that can accept "streams" of information, such as news feeds, and "pools" of data, such as archival databases.

"A lot of organizations are using Lotus Notes as an interface to their databases," says Andersen's Gershman. "There's a trend toward integration, toward not dividing systems into different kinds of documents, and Notes seems to be the most popular [workgroup tool]. It's in version 3 and there's still no competition."

"Notes is a very appealing technology. It's document-based and people tend to think about things in terms of documents," says Ernst & Young's Davenport. Even so, companies shouldn't view Notes, or any other single product, as a one-step cure-all, he says. "The assumption is that once you get one of these systems, the information will start to flow freely. But you have to address cultural and behavioral issues before that will happen."

Tracy Mayor is a freelance writer and editor based in Salem, Mass.

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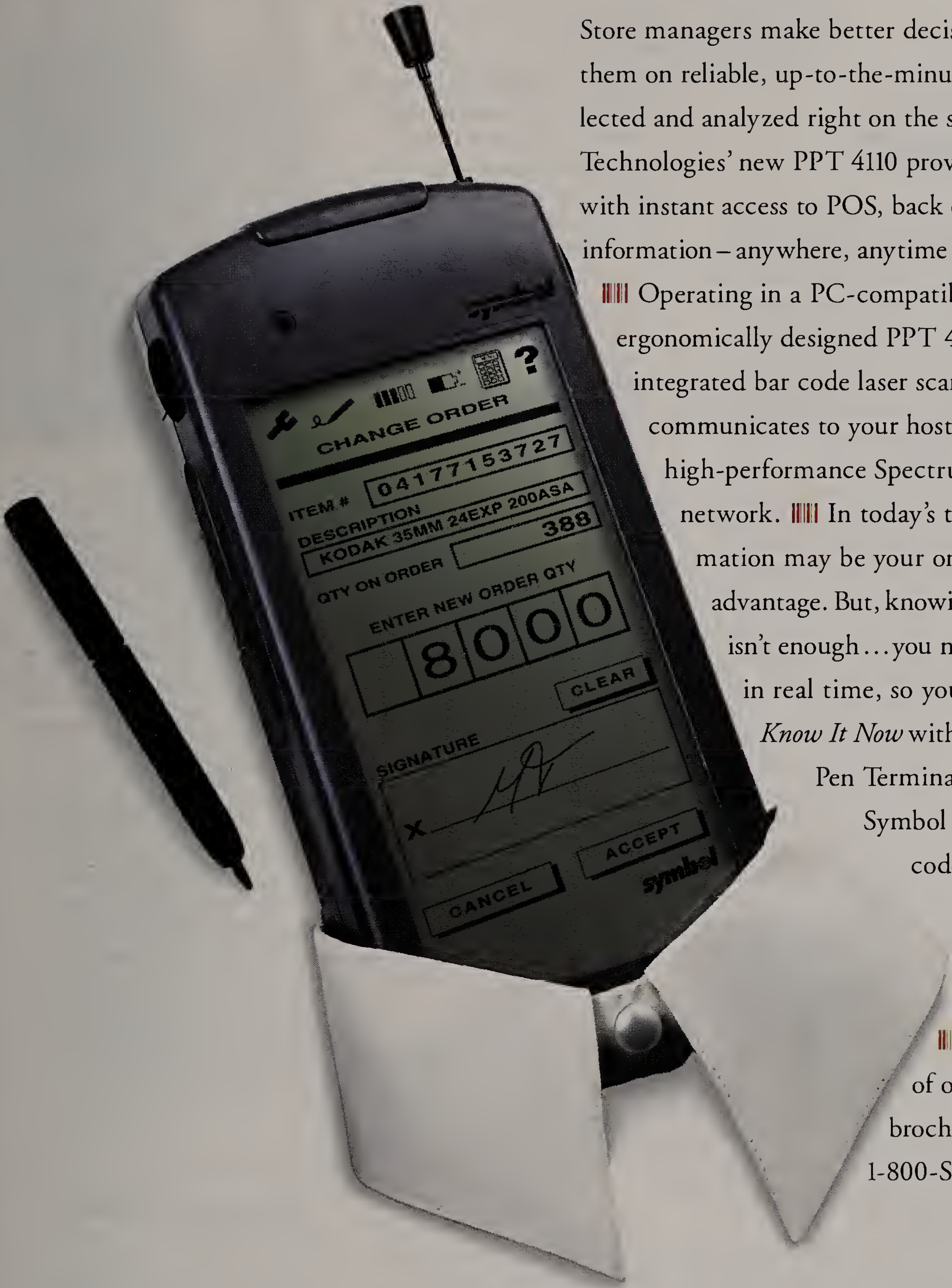

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FRONTLINE

BY PORTIA ISAACSON

Wireless E-mail offers freedom from the shackles of quirky hotel phone systems and insecure locations. But consumers should beware the hype of anywhere/anytime communication.

High Wireless

E-MAIL HITS THE ROAD

One day a few months ago, a small package arrived at my office. In it was a little black zippered case just larger than a paperback book. It was a Hewlett-Packard HP 100LX loaded with RadioMail software, a Motorola InfoTAC wireless modem for accessing the ARDIS network, and a booklet of instructions for sending and receiving E-mail through the RadioMail host to any E-mail address on the Internet. (This whole package costs $995, with unlimited E-mail usage for $89 a month.) On opening the package, I discovered that I had a new identity: portia@radiomail.net.

Not one for reading instructions, I turned on the computer and the modem. The modem's LCD flashed an envelope, and immediately a message popped up on my display welcoming me to RadioMail. I stared with wonder as I realized that not only had the system found me in Colorado Springs to deliver that piece of mail but it could have found me in exactly the same way in any urban center in the United States. I could have been deep in Rockefeller Center, in Salt Lake City's Delta terminal, in the Santa Clara Marriott lobby, in a Chicago taxi or at a client meeting in San Francisco. I could even have been at my breakfast counter sipping my first cup of tea or in my den watching the late news. With its 13,500 radio towers, ARDIS is not everywhere, but it is most places where cellular-telephone service is available.

There are more than 20 million users of E-mail in the United States.

No telephone wires. No dialing. During those first weeks, I watched with awe as the little antenna icon on the modem LCD blinked my E-mail across vast distances. I did enough experimenting to know that messages would appear on other RadioMail users' computer displays in a few seconds (if their modems and computers were on). I could actually hold a conversation in near real-time by exchanging E-mail messages.

Net Gains

A GROWING COMMUNITY

I wanted to communicate with more people through E-mail. I took an informal poll of 30 or so people with whom I interact to see how many are reachable by E-mail. Most computer-industry executives I spoke to had their E-mail addresses readily at hand, but only a few had them on their business cards. Only one person could not be reached by Internet. She said that her employer, a large airline company, has concerns about the security of Internet.

Hooked on RadioMail but impatient with the HP 100LX's small keyboard, hard-to-read display and incompatibility with my Windows applications, I replaced it with a Gateway 2000 HandBook subnotebook computer, a DOS version of RadioMail and a serial cable to the InfoTAC modem. I find the Gateway HandBook to be a good compromise between an easy-to-carry E-mail machine and a computer that will run my Windows applications.

The combination of wireless connectivity and the explosion in the number of people using the Internet (which is said to be growing at the rate of 15 percent per month) has made E-mail a very different communication framework from what it was just a few years ago. Although the DOS RadioMail software needs a major upgrade to Windows, I found the software and the service with the ARDIS metropolitan area wireless network easier than voice mail—and certainly easier than connecting a computer to a quirky hotel telephone line.

Wireless E-mail may be the answer to professionals' low-productivity work time and communication dead spaces. It can be used in meetings that require only light participation, airports where phones are scarce, customer locations where asking for a telephone is awkward, courtrooms where cellular-phone conversations can be overheard and hotels with computer-phobic phone systems (but not during air travel; the FCC bars the use of wireless networks, such as ARDIS and RAM, on airplanes in flight).

There are 14 million users of cellular phones and over 12 million users of mobile computers in this country.

Alternate Routes

YOU *CAN* GET THERE FROM HERE

There are other routes to wireless E-mail besides RadioMail on the ARDIS network. There is RadioMail on the RAM Mobile Data network, which requires the Ericsson Mobidem modem instead of the InfoTAC. When choosing between ARDIS and RAM as your RadioMail transport, the key issues are coverage (ARDIS has greater coverage, although both are likely to meet your require-

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ments), in-building access (ARDIS provides superior reception—I have not measured by how much), reliability (I have used both with no problems; however, you should request data from each provider) and modem characteristics (I like InfoTAC's recharging characteristics but Mobidem's battery life).

There are wireless connections for such internal E-mail systems as Microsoft Mail and Lotus cc:Mail, too. The E-mail server or router can be equipped with an Intel Mobidem AT modem that sends and receives messages to and from similarly equipped mobile computers over the RAM network by simulating telephone access to the E-mail system.

The cost of modems and RAM service to equip in-house E-mail systems with wireless capabilities is similar to RadioMail's cost, so the choice between in-house E-mail and RadioMail should be based primarily on factors such as whether a user has Internet access from his or her in-house E-mail system and whether a user's communication is more internally or externally focused.

Great Expectations

NEW DEVELOPMENTS, HOLD THE HYPE

Wireless E-mail is emerging as this article is being written. Suppliers will be lowering the entry cost of service and the cost of modems. And look for handheld personal communicators with integrated wireless E-mail (for instance, Motorola's Envoy with built-in RadioMail and an ARDIS modem).

In the United States today, there are 14 million cellular telephones in use, more than 12 million mobile computers and over 20 million users of E-mail. Worldwide, more than 20 million people are accessible through the Internet. Wireless E-mail is the logical next step.

Over 20 million people worldwide can send and receive mail through the Internet.

Wireless E-mail is an obviously valuable technology poised for rapid adoption by mobile professionals. But zealots are creating expectations that will disappoint some users with their "anywhere/anytime" slogan, which can be found in every press release and sales pitch about wireless E-mail. Coverage is still minimal in sparsely populated areas and even in some large suburban towns, and there are pockets in most major cities where there is no coverage. Inside some buildings, one or the other network may have poor reception.

"Anywhere" should be replaced by "nearly anywhere that businesses operate." The "anytime" part of the slogan is not true at all. In the sense that "anywhere" is used to mean that communication can take place between any two places, "anytime" should be used to mean that communication can take place between any two times. If we really had an "anytime" communications device, then we could talk to someone from the 18th century or the 21st century.

The wireless zealots are mixing their space and time metaphors. I wouldn't mind except that if we already think we can communicate "anytime," then we won't think about how to build a chronophone.

Portia Isaacson is president of Dream IT Inc., a consultancy and publisher headquartered in Colorado Springs, Colo., dedicated to providing quality business information to customers and creators of frontline IT.

ILLUSTRATION BY TERRY ALLEN

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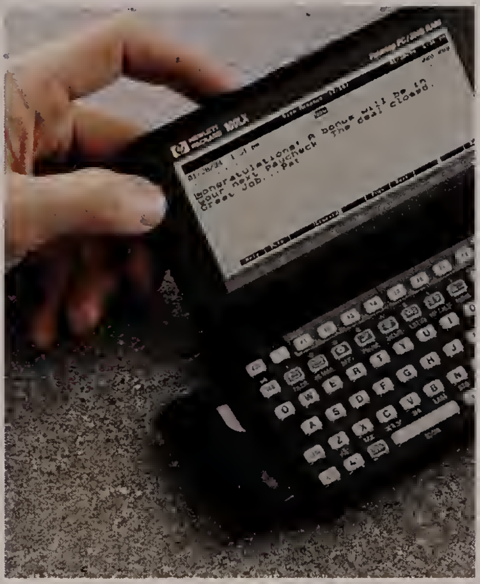
FYI

Instant Replay

Not everyone needs two-way wireless data communication. But for some, the idea of a one-way wireless data-delivery system has great appeal. StarLink from Hewlett-Packard Co., designed specifically for the HP 100LX palmtop computer, transmits voice and data messages as well as news, sports, weather and financial information.



The National Dispatch Center Inc. serves as the central message-control facility. It receives and processes telephone messages and transmits them to the palmtops 24 hours a day, 365 days a year. If, for instance, a team member needs to update you on a client profile and you're on your way to the client's office, she can call a toll-free number and give her message to the operator, who will transmit that message to your HP 100LX. Messages sent via modem automatically appear on your palmtop.

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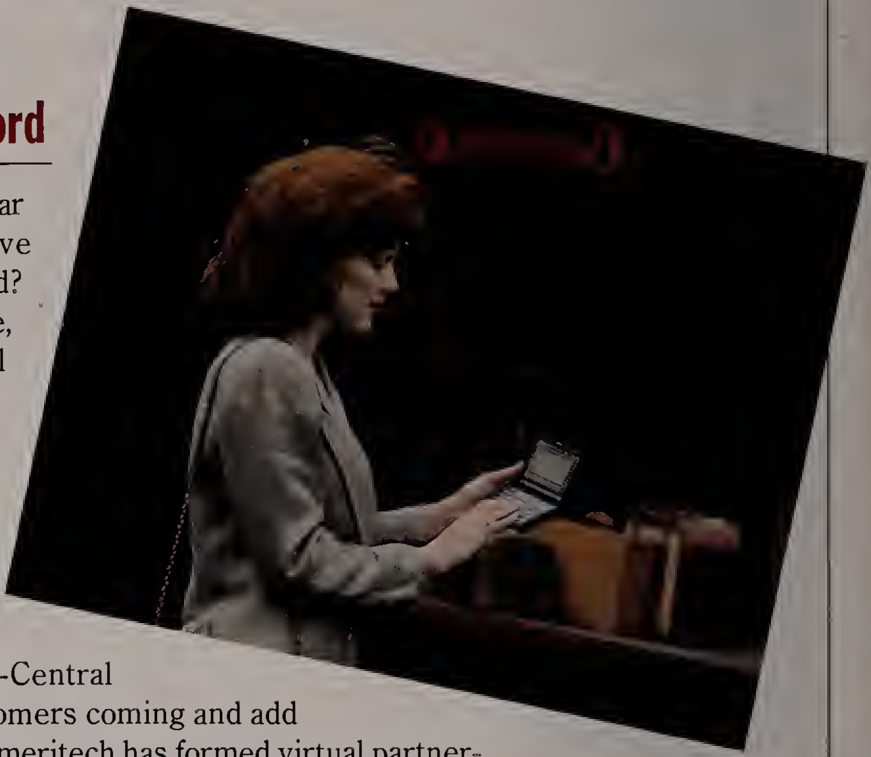
Monthly charges for the service range from $10.95 to $62.95, depending on the options. A 1MB HP 100LX is available for $549, a 2MB version for $749. The Motorola Inc. receiver is $229. To sign up, call 800 917-LINK.

A Wireless Smorgasbord



If Willy Loman had had cellular computing, would he have come to such a sorry end? Maybe not—14 million people, many of them salesmen, will be enjoying the benefits of wireless mobile computing by the year 2000, according to Booz-Allen & Hamilton. Ameritech has already bagged 1 million of those users in its eight-state region straddling the Eastern-Central time-zone line. To keep customers coming and add value to its cellular service, Ameritech has formed virtual partnerships with dozens of vendors to provide turnkey wireless-computing kits.

The kits, which range in functionality from simple one-way messaging to a mobile office, are meant to offer customers lower-cost access to the trappings of wireless. The most comprehensive of the kits—the Wireless Field Partner—comes with a pen-based or notebook computer with a choice of operating system, a digital pager, a cellular modem with communications software and an intelligent interface to the cellular phone that's also included. The package can also incorporate a customer's existing computer or communications software. Related services are available by monthly subscription.

The pieces were provided by Apple Computer Inc., AT&T Paradyne, Compaq Computer Corp., NEC Technologies Inc. and others. Some of the vendors market the packages under their own names. The company that sells the kit acts as sole support coordinator.

Package components are also available individually. Kit pricing depends on configurations. Contact Ameritech in Hoffman Estates, Ill., at 800 662-4531, Ext. 3282.

Communications Unbound

For those who need multifaceted two-way wireless communications in a single device, Motorola Inc.'s long-awaited Envoy will make its debut this summer. Envoy communicates with computers, fax machines and information services from anywhere within the ARDIS nationwide wireless data-communications network.

The new device comes equipped with RadioMail software, which enables users to communicate with public and private E-mail systems (see Frontline, Page 92). AT&T PersonaLink Services let users shop for products and services, seek out information and send "smart" messages. For instance, a high-priority message that does not get immediate attention can be rerouted to other recipients; smart mailboxes can screen, distribute, file and filter messages.

Envoy is based on General Magic's Magic Cap platform and Telescript communications language. It comes with America Online and Official Airline Guides' Flightline service. It also features an address book, calendar, calculator, filing system, note pad, and spreadsheet and graphing capabilities. Users input information by tapping the screen with either an attached stylus or a finger, using an onscreen keyboard or writing messages to be transmitted or faxed. To make a call, for instance, one simply taps the Rolodex icon on the desk screen, then taps the desired telephone number, and the device automatically makes the call.

Envoy measures 7.5 x 5.7 x 1.2 inches, weighs 1.7 pounds and features 1MB of RAM, 4MB of ROM and a rechargeable, eight-hour NiCad battery. When it ships this summer, it will cost about $1,500. Call 800 535-5775.

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CIO Publishing Inc.
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PO Box 9208
Framingham, MA 01701-9208
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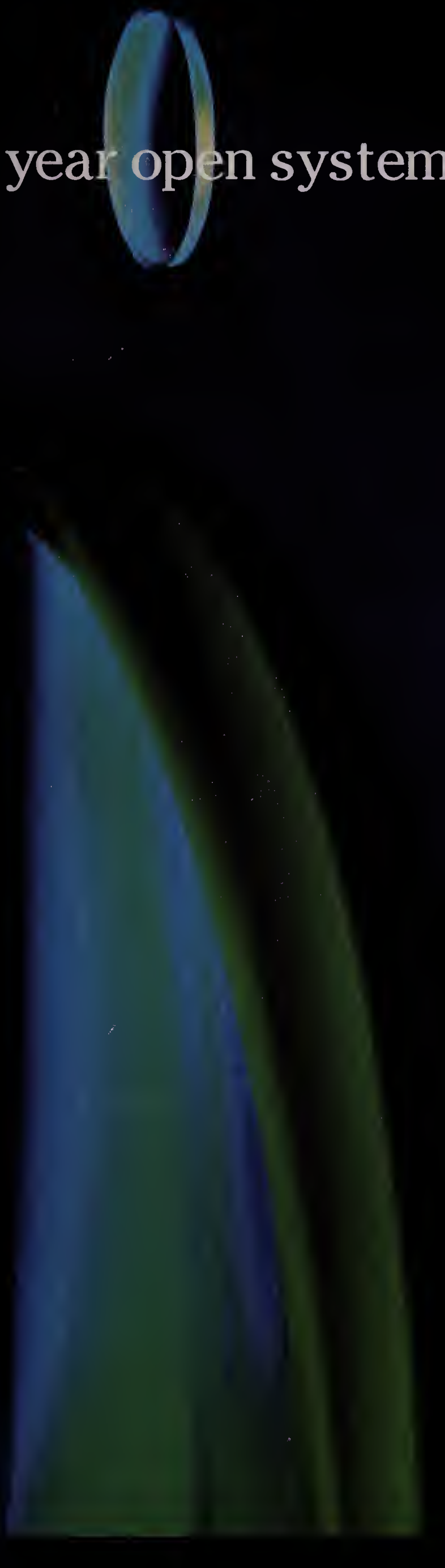

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1. "The CW Guide to Servers," Computerworld, March 22, 1993 and "The CW Guide to Servers and Superservers," Computerworld, January 31, 1994.
2. International Data Corporation, "Data General's Ascent in the UNIX Market," October, 1993
3. "Clash of the Drive Arrays," PC Week, October 11, 1993

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A Timely Investment

Integrated systems are helping Kidder, Peabody brokers make the most of changing market conditions

The old cliche "time is money" can be said to apply to just about any facet of the business world, but in few areas does it have more immediacy than in investing. Market opportunities can come and go in the blink of an eye, but without easy access to the right information, brokers at New York-based investment bank Kidder, Peabody & Co. Inc. couldn't always react quickly.

Kidder, Peabody provides investment services to a wide range of clients, from individuals to money managers to institutions. Brokers in 50 branch offices nationwide allocate clients' assets among different securities based on clients' individual goals and in response to changing market conditions.

In 1987, the firm had installed a market-data system using proprietary dumb terminals and software. The system received an online feed of market data from the vendor and also provided a gateway to "books and records" data, including historical information about client portfolios, on Kidder, Peabody's mainframe.

Data available to brokers using this system was neither comprehensive nor timely, according to Bill Anderson, senior vice president and director of branch administration. While some transaction data was downloaded daily from the mainframe to the local offices, historical and comprehensive portfolio information, for instance, was not. And since mainframe data was stored among multiple file systems, locating information could be difficult. Brokers often had to call the central IS group in New York for help in accessing what they needed, causing delays of as long as two weeks.

In addition, Anderson says, the user interface was difficult to work with, and the system's rudimentary reporting, word-processing and spreadsheet-analysis functions were "impossible to use." Standard monthly reports were produced centrally on the mainframe, but brokers could not run specialized reports, such as performance or historical portfolio analyses, for their clients.

These shortcomings became troublesome when client needs began to change. "Consumers are more sophisticated than they used to be," says Managing Director Steve Satkamp. "People want more than just stock picking to be successful today. They want to increase their financial planning, estate planning, and they want to hire brokers that are full-range consultants." Clients began to request specialized reports on a weekly, even daily, basis.

When the expiration of Kidder, Peabody's contract for the existing system approached, the firm decided to adopt a more sophisticated, flexible solution. In 1992, it replaced the old front end with a client/server architecture running integrated systems. These included a customized portfolio-management system from Advent Software Inc., online pricing services from Automatic Data Processing Inc., customer databases, spreadsheet capabilities and word processing. Approximately 2,600 Windows workstations are linked to about 95 AIX-based IBM servers, which are attached to a satellite-based WAN.

Today, 2,500 investment professionals have immediate access to client information. "In seconds I have an instant picture of a client's profits and losses, percent of total stock, percent of income generated and dependency on a given asset," says Richard Andersen, vice president at the firm. Brokers can better devise investment strategies that meet clients' objectives and react more quickly to market conditions. They can also tell clients how their portfolios are performing in comparison with indexes such as the Dow Jones and Standard & Poor's 500, and provide reports—such as municipal bond summary and evaluation, portfolio analysis and performance history—on demand.

The system is helping bring in new business, Anderson says, including a $12 million account. One feature largely responsible is the ability to do what-if analyses, allowing the firm to show prospective clients how much income their account could generate. Says Anderson, "Customers are passing more assets, and subsequently more revenue, through the firm."

–Nancy Hitchcock & Katherine Auer

VITAL STATISTICS

Organization: *Kidder, Peabody & Co. Inc., New York*

Application: *Portfolio-management system*

Sponsors: *Bill Anderson, senior vice president of information technology (now senior vice president and director of branch administration); Steve Satkamp, managing director, Chicago office*

Technologies: *Advent Software Inc.'s portfolio-management system running on about 2,600 IBM 486 PS/2 workstations; online pricing from Automatic Data Processing Inc.; about 95 IBM RS/6000 servers operating AIX and linked to a nationwide network; Microsoft Word and Excel; Sybase database*

Scope: *2,500 brokers in 50 sites nationwide*

Objective: *To provide customers with detailed, timely portfolio information quickly*

Payoff: *Improved customer service; increased productivity; increased revenues*

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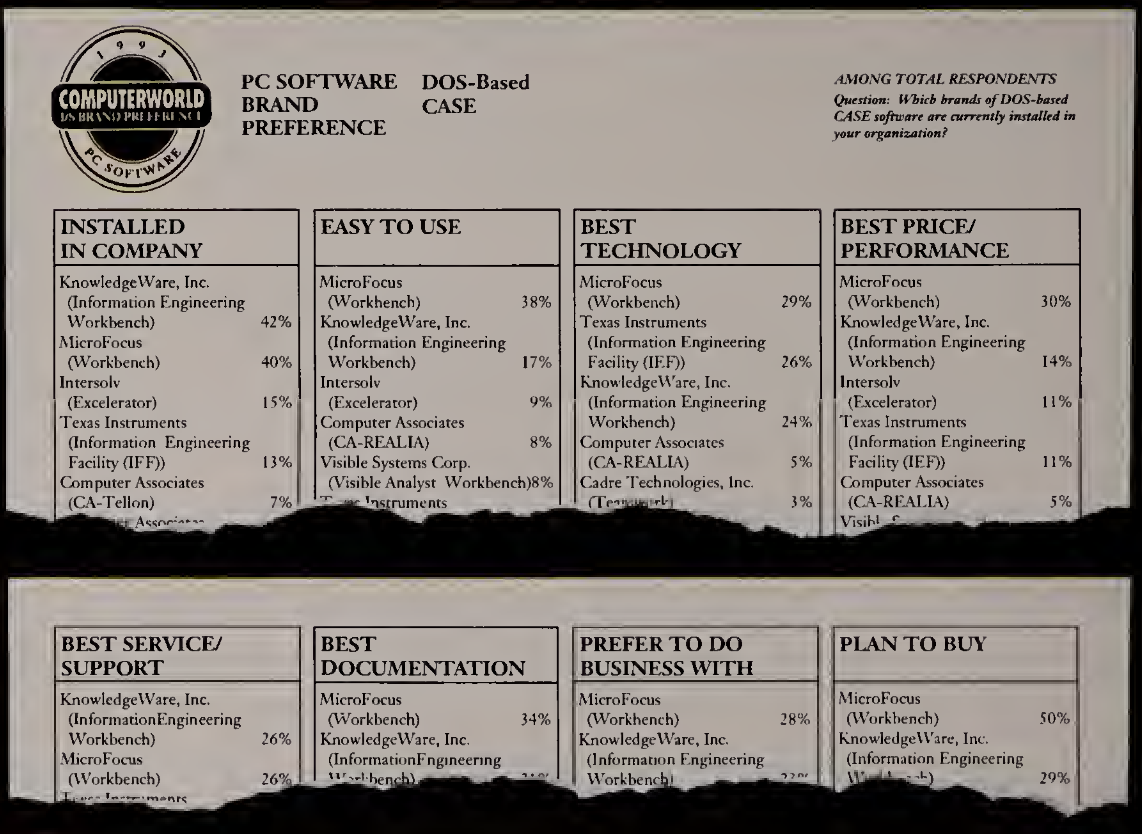

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MicroFocus (Workbench)	40%
Intersolv (Excelerator)	15%
Texas Instruments (Information Engineering Facility (IFF))	13%
Computer Associates (CA-Tellon)	7%

EASY TO USE	
MicroFocus (Workhench)	38%
KnowledgeWare, Inc. (Information Engineering Workbench)	17%
Intersolv (Excelerator)	9%
Computer Associates (CA-REALIA)	8%
Visible Systems Corp. (Visible Analyst Workbench)	8%

BEST TECHNOLOGY	
MicroFocus (Workbench)	29%
Texas Instruments (Information Engineering Facility (IEF))	26%
KnowledgeWare, Inc. (Information Engineering Workhench)	24%
Computer Associates (CA-REALIA)	5%
Cadre Technologies, Inc.	3%

BEST PRICE/ PERFORMANCE	
MicroFocus (Workbench)	30%
KnowledgeWare, Inc. (Information Engineering Workbench)	14%
Intersolv (Excelerator)	11%
Texas Instruments (Information Engineering Facility (IEF))	11%
Computer Associates (CA-REALIA)	5%

BEST SERVICE/ SUPPORT	
KnowledgeWare, Inc. (InformationEngineering Workbench)	26%
MicroFocus (Workbench)	26%

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KnowledgeWare, Inc. (InformationEngineering	

PREFER TO DO BUSINESS WITH	
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